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Lightning Conductors.

IT is surprising what a small amount of knowledge concerning lightning conductors contents most people. Since Franklin proved, one hundred and fifty years ago, that a lightning flash and a spark from an electrical machine merely differed in magnitude, and hence that pointed iron rods might be used to protect buildings, popular knowledge on the subject has made very little progress. Up to 1881 there was no code of rules published in this country for the erection of lightning conductors, and since that time the vigorous attack made by Professor Oliver Lodge on the report of the Lightning Rod Conference, and the equally vigorous defence of it by Mr. Preece, has left public opinion in a very undecided state. This diversity of opinion which existed amongst experts a few years ago, and still exists in a modified form, has led to a good deal of scepticism about the efficiency of lightning conductors, a prevalent belief even being that they are a possible source of danger. There is also the comforting assurance in almost every fire insurance policy that it covers damage done by lightning, and so people are apt to encourage a theory that saves their pocket.

In view, however, of the mass of evidence collected by the Lightning Rod Conference and others, this scepticism is very irrational. We are inclined to think that almost any lightning conductor is better than none at all, and published results prove that the loss of life and property by lightning is by no means inconsiderable, and can be greatly diminished by fixing lightning conductors. It is therefore of importance to consider their real action, what material they ought to be made of, and how they should be fixed on buildings. It will be seen from the experiments described below, that, apart from a few general rules, no rigid code can be given. Every building has to be considered on its own merits, and an architect can often point out possible dangers to the expert which can be guarded against very simply, and which he might easily overlook.

How atmospheric electricity arises need not detain us long; plenty of plausible theories have been put forward, but the simplest and best is that which ascribes it to the friction of water vapour, either against the ground or against the particles of ice which form various kinds of clouds, the action being similar to that in Armstrong's steam electric machine. A thunder-cloud can readily be detected by its black and lurid appearance, and thunderstorms in this country are nearly always accompanied by rain. If we let an electrified point connected to a frictional machine discharge itself into steam coming from a kettle we get a miniature thunder-cloud, the electrified steam having a black and heavy appearance. The effect of electrifying the particles of water which form the steam is to diminish their surface tension so that they coalesce very readily and form drops of water. This also explains why the rain drops during a thunderstorm are so big.

It is universally admitted that a lightning flash is similar to the spark from a Leyden jar, but on an enormously larger scale. A Leyden jar consists of a wide-mouthed glass bottle, the inside and outside of which have been coated with tinfoil up to a certain height. On connecting the two coatings to the terminals of a Wimshurst machine, and turning the handle, certain quantities or charges of electricity are collected on the two coatings. In modern language, one of these charges is at a very high potential or pressure, and the other is at a much lower pressure. If the pressure between them be increased above a certain limit, a spark will take place either through the glass, puncturing it, or over the edge of the bottle, and the pressures between the two coatings will be equalised. Now, in the case of the thunderstorm, the cloud represents one coating of the Leyden jar, and another cloud, or the earth, the other, and the air between them has the same function as the glass. When the difference of electrical pressure between the cloud and the earth, or between the cloud and another cloud, gets too high, a flash of lightning takes place, and this difference of pressure is equalised at least between a portion of the cloud and the earth, or between portions of each cloud. In this latter case the pressures between the two clouds and the earth are altered, so that it happens not unfrequently that a flash between two clouds is instantaneously followed by a flash between one of them and the earth. Professor Lodge was the first to point out the important difference there is between the two cases, and to show experimentally that lightning-rods which afford perfect protection in the first case might afford very little in the second. His experiments on model lightning conductors, which we shall describe below, are now incorporated amongst the experiments to be done in the physical laboratory course at many universities and technical colleges, and the younger generation of physicists believe as strongly in inductance and oscillatory discharge as the older generation did in conduction and what Professor Lodge somewhat irreverently calls the drain-pipe theory.

The older generation said that the disruptive discharge between the cloud and the earth follows the path of least resistance, This is undeniably true, but the difficulty is to tell what will be the path of least resistance. This resistance was understood by many to be the same as the resistance we are concerned with in telegraphic work, and hence it was concluded that high conductivity copper, and plenty of it, should always be used. That this kind of resistance has very little to do with the almost instantaneous growing and dying away of a current in a conductor was not appreciated until electricians got used to alternating current work, and then gradually it began to dawn upon them that to find the path of least resistance was a far more complex problem than had been at first anticipated. It was found necessary to solve all kinds of difficult mathematical problems before it could be shown that the experimental results followed from Faraday's and Clerk Maxwell's theory.

In what follows we shall describe Lodge's experiments as simply as possible, and lay stress only on those theoretical points which are useful in practice.

Experiment I.—This experiment illustrates the protective action of points and knobs when the difference of electrical pressure between a cloud and the earth is comparatively slowly established.

The apparatus necessary for this experiment is a Wimshurst or other frictional machine, two metal trays, and a few metal objects to illustrate lightning-conductors, such as a large metal ball, a small one, and a needle, all of them being on metal supports, which will admit of their heights being altered. Place one of the metal trays on tumblers placed on a table, and support the

other by means of tumblers put on the top of the first. We thus have two horizontal sheets of metal insulated from one another and from the table. Now take two wires and connect them to the terminals of the electrical machine and to the two trays, so that each tray will be at the electrical pressure of the terminal to which it is attached. On placing in the lower tray the large metal ball and the smaller one and turning the handle of the machine, it will be seen that the sparks hit the small ball even when the larger one is much nearer the top plate. When we put the needle on the lower tray the sparks, which are now far more difficult to get, hit the needle. If we put several needles, it is impossible to get a spark at all, the balls being thus efficiently protected by the quiet discharge from the needles.

It is instructive also to place a burning gas jet on the lower tray, the gas being supplied by a piece of rubber tubing. It will be found that the gas jet protects balls and other blunt metal objects on the tray, the spark hitting the gas jet; but it is not as efficient a protector as a needle. This shows that a column of heated air is a good conductor for electric discharges.

If we replace the top tray by a sieve full of water, to represent the rain, it is impossible to get a spark at all while the water is pouring into the lower tray.

Experiment II.—To illustrate the protective action of points, &c., when a flash of lightning takes place between two clouds, and one of them instantaneously discharges to the earth.

In addition to the apparatus used in the last experiment, two Leyden jars are needed. Place the two jars on a wooden table and connect their knobs by two wires to the terminals of a Wimshurst machine, and their outer coatings by two other wires to the two trays arranged as in the last experiment. On turning the handle of the machine the inside coatings of the two jars receive equal and opposite charges, and the outside coatings will have equal and opposite charges induced on them. If a spark take place between the terminals of the machine, the inside coatings of the jars are instantaneously brought to the same pressure, and the charges on the outside coatings being no longer "bound," will rush to the two trays and a spark will take place between them if they are not too far apart.

In the last experiment the difference of electrical pressure between the two trays was brought about, comparatively speaking, slowly; in this case it is brought about instantaneously. On putting our model lightning conductors on the lower tray, it will now be found that if they are all at the same height they are struck indiscriminately, and if they are at different heights the highest protects the others. Hence, a needle point will be protected by a blunt knob the least bit higher than it. This shows that (in the last experiment) the stream of electrified air arising from the point prepared a path for the discharge to the point. On putting the gas jet on the lower tray it will, as a rule, protect the others, the flash taking place down the column of heated air.

If we put the sieve full of water instead of the top tray, sparks still ensue, and the drops illumined by the flashes appear stationary. The model lightning conductors act as before, their height being the only important consideration. As in the last experiment it was impossible to get sparks when the water was dripping through the sieve, it looks as if the lightning flashes that occur during heavy rain are examples of the "impulsive rush" of an electrical discharge and would come under this case.

In Experiment I., if we put a wet rag between the model lightning conductor and the lower tray, so as to enormously diminish its electrical conductivity, it still acts as an efficient protector; perhaps even more efficiently than formerly, as the sparks between it and the top plate are now less violent and noisy, and hence are less likely to damage it. In the second case, if we introduce a wet rag between the lightning protector and the lower tray it ceases to protect, and objects lower than it are struck.

Experiment III.—To illustrate what happens in the neighbourhood of a metal rod carrying a sudden electrical discharge.

Take a thick copper wire, and connect one end of it to the outer coating of a Leyden jar, and after laying the wire round the room, place the other end near the knob. On charging the jar by a frictional machine, when the electrical pressure gets high enough a spark will take place between the knob and the wire, and the jar will be discharged. A little consideration will show that the phenomena which happen near this wire must be analogous to those which happen near a lightning rod when it is struck by lightning. It would be foolish to assume that the effects in the latter case are less violent.

If there is a piece of metal near the rod a spark will take place between it and the rod. If there are two pieces of metal near one another, whether connected by a wire or not, a spark will ensue between them, even when they are a good distance from the rod.

If a piece of thin wire be stretched near the rod a spark will ensue at each end of the wire, showing that some of the charge travels by the thin wire.

Professor Lodge showed that holding a small coin on a stick of sealing-wax near the rod a spark often hit it. If a knuckle be too near the rod a spark will take place to it, and a violent shock be received.

If we only take into account what electricians call the conductivity of the copper rod, these results are quite inexplicable. It was laying too much stress on this conductivity, and forgetting the enormous resistance that a thick copper rod offers to the instantaneous rise of current in it, that made the delegates of the 1882 conference allow the following to be printed:—

A man may with perfect impunity clasp a copper rod an inch in diameter, the bottom of which is well connected with moist earth, while the top of it receives a violent flash of lightning.

A very mischievous statement, and although we do not go so far as Professor Lodge, and demand "that the prophets of the old superstition should be slaughtered at the brook Kishon," yet we are certain that this statement is almost an invitation to a most deadly experiment.

It was known to Faraday, that when an electric current was flowing in a wire it possessed a kind of inertia. It was impossible to stop it instantaneously, just as it was equally impossible to start it instantaneously. It is this property of electricity that is referred to so often as electric inertia. It is not to be understood that an electric current is material, but merely that it possesses a property analogous to the inertia of matter. If the barrel of a gun be full of snow, the snow can easily be got rid of by pushing it out slowly with a ramrod, but if we attempt to fire it out of the gun, there is a great risk of the gun bursting. The resistance offered by the snow to sudden changes in its state is enormous, although it offers hardly any resistance to more gradual changes. In like manner the resistance offered by a thick copper rod to a sudden rise of current in it is exceedingly large.

This property of an electrical conductor is called its inductance, and is very familiar to alternating-current electricians. If a coil of wire have large inductance, then if a constant pressure of 100 volts be applied to it, the current will rise slowly from zero until it attain its steady value, which merely depends on the resistance of the wire. The time it takes to rise to its steady value is independent of the electromotive force applied. It follows that a great pressure applied for the millionth of a second to a conductor of even small inductance will not develop any great current in the rod, and that time will be needed to get rid of the energy stored up in the rod when its terminals are at different pressures.

One phenomenon of a Leyden jar discharging through a thick copper rod must be mentioned, as it may have an important bearing on lightning discharges, and that is that the discharge is oscillatory. Instead of there being only one spark, there are several, the charge oscillating between the two coatings of the jar, until all its energy is dissipated in light, heat, and magnetic effects. If we put sufficiently high resistance in series with the copper-rod, then the discharge ceases to be oscillatory, and we have only one flash. In the oscillatory case, the interval between successive flashes is so short that it is by no means easy to analyse the spark into its successive flashes, but it has been done over and over again in many physical laboratories, and the results are in exact accordance with theory.

The question then arises whether a lightning flash is oscillatory, and, unfortunately, we have no direct observations on this point. If we took a photograph of a lightning flash on a sensitive plate revolving 1,000 times a second we should probably be able to tell. There are numerous well-authenticated cases where a lightning flash has continued for several seconds; this, of course, does not prove that it is oscillatory, but it is easier to explain on such an hypothesis. Up to the present time we are justified in saying on theoretical grounds that if we have a thick copper-rod for a lightning-conductor then it is exceedingly probable that the lightning charge will oscillate up and down it several times before the charge is dissipated.

In considering the protective action of lightning-conductors we must remember that when the difference of pressure between a cloud and the earth is great, there is a considerable amount of energy stored up between them. When a lightning discharge occurs, some of this energy is got rid of, or rather transformed, in a very small fraction of a second, hence the power developed is enormous. A discharge passing along a bell wire volatilises it, or if along an insulated electric-lighting wire it breaks it up into small pieces and shoots it out of its covering

A tree struck by lightning appears as if torn in pieces by an explosion of dynamite. It follows that the energy got rid of in the lightning-rod itself cannot be assumed to be a negligible quantity. This is one of the considerations that lead Professor Lodge to recommend iron for lightning-conductors, as it has a higher fusing-point and greater specific heat, and so a larger amount of energy can be safely got rid of by it. This is certainly worth being taken into account when comparing the relative merits of iron and copper.

Franklin stated that the function of a lightning-rod was two-fold. (1) To conduct the charge to earth, and (2) to prevent a lightning flash at all by the gradual equalisation of the pressure between the clouds and the earth by the continual discharge of the points to them. We think that the tendency of modern electricians is to minimise too much the second of these actions. It has been stated that the strokes of lightning avoided by having sharp points to conductors would probably be quite harmless. We think this is erroneous. Statistics prove that there is a great diminution in the number of lightning flashes whenever a town erects many lightning-rods. During some violent electrical storms in America, it has been noticed that lightning-rods, trees, and other pointed objects have brushes of light on them, and make an audible fizzling noise, illustrating the energetic protective action of points. Statistics also show that when many trees in a district are cut down, the number of fatalities from lightning is increased.

Experiment I. illustrates excellently these functions of a lightning rod. Experiment II. disproves that a pointed lightning rod can protect objects at a greater height than itself. It explains also why a lightning flash often passes down straight into a blast furnace, although it is furnished with a long-pointed lightning rod. Lightning strokes often strike prominent objects on the roof of a house, do harm to the roofs and then pass off by the metal gutters and rain-water pipes. The roof of the University Galleries, Oxford, was struck this summer by lightning and set on fire, although it was protected by four lightning conductors.

Experiment III. proves (1) the tendency of lightning-rods to side-flash; (2) that metal bodies near the lightning rod may produce sparks when a discharge passes; (3) that there is no space round a pointed conductor that is absolutely protected from lightning flashes; and (4) that the conductivity of lightning-rods is not nearly so important as their inductance. The first of these conclusions modifies to a certain extent the statement of the Lightning Rod Conference that insulation is unnecessary and mischievous. Professor Thompson goes so far as to say that, in ordinary buildings, conductors should be insulated from walls so as to prevent the liability of lateral discharge to stove and gas-pipes, &c. This we should not be inclined to recommend, except in very special cases, as insulators would be costly; but if a long piece of piping is near and parallel to the lightning conductor, we would connect the piping to the conductor, making sure that its section was nowhere too small.

The second result shows a possible danger, as this spark may light escaping gas. The third result has been pretty clearly proved by an examination of many published accounts of accidents from lightning. Several photographs have been taken showing a multiple flash of lightning, one branch of which strikes the lightning-conductor and others various other parts of the building near.

It follows from (4) that an iron wire rope is quite as efficient a lightning-conductor as a copper one, the only thing limiting its size being its liability to be burned up. In practice, a rope seven-twelfths of an inch in diameter is always found amply sufficient. Of course the iron must be well galvanised, or it would soon rust away in this climate.

The question of whether to connect all masses of metal, such as lead roofs, pipes, hot-water systems, &c., to the lightning conductor requires careful consideration in each case. There is no doubt that having gas and water pipes all over the house increases its liability to be struck, and to connect them all indiscriminately to the lightning conductor is a dangerous thing to do. Metal balconies ought never to be connected to the lightning conductor, as in this case they would be simply death-traps during a thunderstorm.

Private houses in towns are rarely struck by lightning. This immunity is probably due to the lead roofs used and to the iron rain-water pipes connected to them. As there is an open space between the end of the pipe and the grating of the drain, Mr. Preece recommends that the iron stack-pipe should be connected to the drain by a wire, or, more simply, that the open space between the pipe and the drain should be made by cutting only three-quarters of a portion of the pipe away and leaving a quarter to make the electrical connexion. It is also worth noticing that, to make the stack-pipes which ventilate soil-pipes prominent objects on the roof is dangerous, as they are then lightning conductors terminating often on earthenware pipes on the first-floor. They most certainly ought to be connected to the earth, either by a rain water-pipe or otherwise.

We have not thought it worth while to talk about securing against damage by globular lightning, which, although rare, is by no means so rare as it is made out to be in books. It consists of a ball of fire moving slowly through the air, and then exploding suddenly. In protecting dynamite factories, powder magazines, petroleum tanks, &c., it would be as well to remember about these balls of fire. Of the two we have seen, one hit the wall of a soldiers' barracks, but did no apparent harm, although it made a considerable report and startled many of the soldiers; the other passed slowly out of sight. Published cases, however, prove that they are sometimes very destructive in their effects.

In the following rules for the erection of lightning-conductors we have confined ourselves principally to general considerations representing the present state of knowledge on the subject. Some of our recommendations are in direct opposition to the rules contained in many books, but we are justified in making them, as we have the highest scientific authority on our side, and, if practical experience is to count, iron conductors have had a far longer test than copper ones. It is to be understood that no rigid code of rules can be given, and architects must be guided by circumstances, and be prepared to modify their systems in accordance with our present knowledge of impulsive electrical discharge to suit the special problems that arise.

Conductors.—Well galvanised iron rope or tape should be used, about half an inch in diameter. The copper rope and tape so much used in this country is efficient, but less so than if it had been iron, so that it is needlessly extravagant. The conductor must be of the same metal throughout from points to earth, so that galvanic action is avoided. Sharp bends and loops must not be permitted.

Points.—The points for elevation rods ought to be made of nickel-plated iron. Tall rods are ugly and no advantage is gained by their use. Every part of the outside, such as chimney-stacks, ridges, &c., should have a lightning-conductor running along them; and it is advisable to fix a number of points along the ridge of the roof. Over the top of the chimneys it is well to place a loop, or arch, of the conductor.

Interior of Building. — Gas pipes and electric light wires must be kept away from proximity to the lightning-conductor. The tendency to sideflash to stove pipes, &c., must be borne in mind, so that sometimes it may be necessary to detach it from the building by insulators. If a water pipe goes near the lightning-conductor, connect them metallically.

Exterior of Building.—Connect all external metal work, lead roof, gutters, stack-pipe for ventilating soil pipes, &c., together, and to the earth.

Earth. — The conductor must be well earthed in a damp stratum by means of a galvanised iron plate. In addition it ought to be connected to the water main.

Testing.—Conductors should be inspected and tested once a year.

Some districts are much more liable to thunderstorms than others, and some kinds of soil seem to be particularly liable to be struck. In a United States Bulletin issued last year, the relative frequency of strokes on different soils is given as follows:—1 in chalk, 2 in marl, 7 in clay, 9 in sand, and 22 in loam.

A very cheap and effective way, which ought to be better known, of protecting an isolated building is to run ordinary galvanised telegraph wires up the corners, along the ridges, and up the chimney stacks, the highest parts of the network ending in metal points, and the lowest parts being in good electrical connection with a moist earth stratum.

In conclusion, we would urge all those interested in lightning-conductors to make Lodge's experiments for themselves. The apparatus necessary is cheap, and if care be taken not to get a shock from a Leyden jar, the experiments are quite safe. They give accurate knowledge about impulsive rushes of electricity, and invariably strongly interest spectators. The more one studies thunderstorms and classifies the eccentric effects of lightning flashes, the more gratitude does one feel to Professor Lodge for having reproduced many of these effects so simply experimentally, and for having so clearly applied theory to explain them.

THE LATE SECRETARY OF THE INSTITUTE.

ALL who are connected with the Institute of Architects, whether in London or the provinces, will feel the greatest regret at the news of the death of Mr. W. H. White, the well-known Secretary of the Institute, who had held that post since 1878. Mr. White

had been in bad health for nearly eighteen months, and went away for six weeks in February and March last for change of air and scene. He returned for a month's hard work, and was last at the Institute at the end of April, since which time he was too ill to attend at the office, though he continued till quite lately his editorial work for the *Journal* of the Institute. Latterly he became rapidly worse, and died at his residence at Oxford and Cambridge Mansions at four o'clock on the morning of Tuesday last.

Mr. White, who was born in 1838, was educated to the architectural profession as the pupil of Mr. George Morgan. At about twenty-five years of age he went to live in France; what determined his choice of that country for his professional career we are not aware, but he became for a time an assistant to a French architect, partly by way of acquiring familiarity with French methods of work, and subsequently started practice for himself in Paris. He had a little difficulty at first in overcoming the prejudice of Paris clients against an architect not native among them, one of his first clients objecting, at the outset, to employing any architect who had never built a Paris house before, to which he replied by pointing out that on that principle none could ever have been built. But he succeeded in getting a fair start as a French architect, and had built among other things the Château of Martinvast near Cherbourg, and restored the Château of Bizy and another near Bruges; and he would in all probability have spent his life in successful practice as a Paris architect but for the war of 1870, which rendered the French capital no longer either an agreeable or a profitable place of sojourn. His father, Dr. William White, having been in the Bengal Medical Service, he no doubt had the means of getting introductions and a connexion in India which decided him on going there, where he was for two years in the service of the Department of Public Works, and carried out several buildings, one of which, the "Court of Small Causes," Calcutta, was illustrated in the *Builder* of March 23, 1878. In 1873 he left India, however, and took up his residence in London, the thread of his Paris practice having been effectually broken. He was appointed examiner in architecture at the Engineering College at Cooper's Hill, and did not make any special attempt to return to practical architectural work in London, but he devoted a good deal of time to literary work on architectural subjects, and was at this period a frequent contributor to the *Builder*, generally in the shape of long articles on important subjects connected with public architecture, to the preparation of which he devoted a great deal of pains and study. In 1878 the appointment of Mr. Eastlake to his present position at the National Gallery left the Secretaryship of the Institute vacant, and Mr. White was appointed as his successor, a position to which he had perhaps a special claim, owing to the attention which for some time previously he had given to the work of the Institute, and the prominent part he had taken in the discussion of its procedure on various occasions.

From that time Mr. White almost lived for the Institute, and never had such a body a more faithful, zealous, and loyal official. His practice in literary work constituted him a most efficient editor of the *Journal* of the Institute, which he did his best to keep up to a high standard of interest and literary quality, and his familiarity with French, both in speaking and writing, was of special service in the relations of the Institute with foreign architects.

Mr. White's Parisian experience at the outset of his professional life coloured all his architectural sympathies afterwards; his way of thinking of and looking at architecture was always French rather than English. This was obvious in the clever and ably written little book which he produced in 1884—"Architecture and Public Buildings, their relation to School, Academy, and State, in Paris and London," the avowed object of which was "to advocate the expediency of establishing in this country a more thorough academic representation of the higher arts than now exists;" in other words, to hold up the French academic system as an example to us. Whether he was right or wrong in this view is far too large a question to discuss in this short article, but the book contains much good sense on various points connected with the position of architecture in this country. He was one of the first to call attention, in this book, to the unsatisfactory treatment of architecture at the Royal Academy, where it was illustrated only "as a collection of sketches and drawings of a *dilettante* character," and was taught merely as an "art of design." If, he said, the annual exhibition "is to be fairly monopolised by painters and sculptors, the Schools in recompense may well undertake to teach architecture, and train not merely designers, but men fit to practise it as a science as well as an art." The criticism is as much called for now as when it was written; the Ecole des Beaux-Arts does give such training, the Academy of Arts does not. In other respects Mr. White was a keen and often effective critic on the contemporary architectural developments of his day, and some of our readers may remember the amusing paper which he read, we think at a meeting of the Architectural Association many years ago, on the early vagaries of the architectural movement, which afterwards developed into what is now called "Free Classic," and the drawing which he made of a quasi-classic building with immense Gothic gargoyles, and the word "BVILT" followed by the date within an oval cartouche—a drawing which delighted Fergusson, the historian of architecture.

Personally the Editor of this journal has to record his regret at the loss of an old acquaintance with whom he has been on terms of unbroken cordiality and confidence for many years back, both before and since Mr. White's appointment as Secretary to the Institute; a cordiality which was not in the least interrupted when they were, as they were almost up to the last moment, rival candidates for the office at the time Mr. White was appointed. As an instance of Mr. White's good feeling and generosity we may record one little incident on this occasion, hitherto known only to those concerned. Mr. White applied to Mr. Godwin, the then Editor of the *Builder*, to publish an illustration of a building of his, in order to give him a better position in his candidature, as the former architect of some important buildings; but his request was coupled with the condition "unless you think it unfair to Mr. ——," naming his rival; and ultimately he desired it to be left to the rival candidate to say whether the illustration should be published or not. It need hardly be said that the right of "veto," thus generously given, was *not* exercised.

Mr. White's funeral was to take place at Nunhead Cemetery at 12.30 on Thursday. Up to the time of going to press we have not heard any particulars as to who attended on the occasion.

NOTES.

The Nelson Monument.

The notable revival of public interest in such anniversaries as that of Trafalgar is a significant and gratifying sign of the times—an indication of a quickening of public spirit in the country, of a renewed pride in the great deeds of the past, and of a sense of something higher than the "nation of shopkeepers" theory of public life. In connexion with this feeling one is glad to see also, as a minor matter, the tendency to grace such occasions by the decoration of public monuments connected with them. In Paris the decoration of statues and monuments at anniversaries has long been a habit; in London we have hitherto paid little attention to this decorative manner of celebrating an anniversary. It is pleasant to see some life and colour given to our streets by such decoration as that which has been carried out at the Nelson monument. Now that the idea of this source of decorative effect in our usually dull streets has been so far popularised, it is to be hoped that this graceful practice will be of more frequent recurrence.

American Institute of Architects.

The Thirtieth Annual Convention of the American Institute of Architects was announced to take place during the present week, on the 20th, 21st, and 22nd, at Nashville. The first day was to be devoted to formal business, Reports of Committees &c. For the second day the Committee on Education had arranged for a series of papers by Messrs. R. D. Andrews, C. F. Osborne, J. W. Yost, Dankmar Adler, N. C. Ricker, and G. F. Newton, on the subject of "The Influence of Steel Construction and of Plate Glass on the Development of Modern Style." These ought to be of some interest, as well as the general discussion to which they are to be regarded as introductory. Mr. W. Martin Aitken, Supervising Architect to the U.S. Treasury Department, was announced to read a paper on "National Architecture." At the Thursday meeting Mr. James B. Cook was to propose the creation of a Standing Committee on "Applied Arts and Sciences." The report of the whole proceedings will no doubt be issued and will reach us, as it always does, in full detail and in excellent form; but also, we must add, always a very long time after date. A more prompt publication would surely be desirable, and would be welcomed by readers on this side of the Atlantic.

Newcastle-on-Tyne Electrical Exhibition.

We have received a first copy of the prospectus of an Electrical and General Engineering Exhibition which it is proposed to hold next year at Newcastle. We are told that the arrangements are now so far advanced that the promoters can assure all those interested that the Exhibition will be of a thoroughly comprehensive character. We are also told that the Exhibition is to be on a larger scale than any hitherto held out of London,

and that it will have this distinct advantage over all previous exhibitions wherever held—namely, that "it will include the most recent examples of inventive skill." It is surely a very obvious fallacy to put this in a prospectus. The classification of the exhibits, which are, as usual, to include almost everything, is good, but the phonograph should not come under the head of electricity, although Edison was its inventor. It is stated that the Exhibition will also commemorate the sixtieth year of her Majesty's reign, and will illustrate the changes and developments that have taken place in electrical engineering and other leading branches of industry since 1837—the year of the Queen's Accession.

What is a "New Street"

A CASE of some importance recently came before Mr. Bros, one of the London magistrates, in regard to a new street. It appears that the owner of some property at Homerton began to build some houses fronting an old lane which ran from Sidney-road, Homerton. The question which the magistrate had to decide was whether this building of houses along an old lane was the making of a "new street" within the meaning of the London Building Act, 1894. The contention of the owner of the property was that there was no new street. We fail altogether to understand how this contention can have been put forward. It is of course a question of fact; but how what was obviously only a country lane which had become surrounded by houses could be regarded as an "existing street," passes comprehension. As soon as houses are erected in a line along an old roadway, and it changes its character, it becomes a new street. This was the decision of the magistrate; a different result would have practically reduced the Building Act in this respect to a dead letter.

Construction of Station Roofs.

THE report of Major Marindin, the Board of Trade Inspector, on the accident last August at Nottingham Station contains an important recommmendation in regard to station roofs. The accident in question was caused by a truck being thrown off the rails and hitting a cast-iron pillar which supported a part of the roof. The result was that a large piece of the roof fell, doing injury to six persons. Major Marindin does not mince the matter. He states that it is undesirable to place pillars, or columns of any description near the permanent way, where they may come in contact with any rolling stock. It appears that there are still a number of stations in England where roofs are supported by columns, often of cast iron, which are liable to break under a heavy or sharp blow. If columns are placed on a platform, no harm can be done, and consequently the tendency is now to erect larger roofs than was formerly the case. Of course, after this report, a railway company runs the risk of having to pay damages if an accident similar to that at Nottingham again occurs and persons are injured by it.

Sewage of Truro.

THE other day we printed a letter referring to a common practice in various towns in Ireland of letting the sewage run direct into the river when there was one contiguous to the town. It seems we have not entirely emerged from the same barbarous practice in England, for in the last of the monthly reports of Mr. Trevail, the Chairman of the Sanitary Committee of the Cornwall County Council, we find it noted that during the summer months great complaint has been made of the smells arising from the discharge of the sewage of the city of Truro into the two rivers flowing through the place, and remaining stagnant with each tide for many hours together, in the very heart of the population. The Report adds, "The Corporation are just where they were a quarter of a century since—considering the matter." If they remain "considering the matter" much longer, they will perhaps find the matter will consider them—as favourable subjects for typhoid and diphtheria.

Gateshead Union Competition.

WE do not know to what lengths the system of fleecing architects in competitions is to go; but the Gateshead Union seem to have gone as far in that direction as it is possible to go, and we do not see what further remains, unless it be to make the competing architect pay the cost of carrying out the building. The details are given in a letter from a correspondent in another column. The point we may call attention to here is, that the Union have offered no premium at all to competitors; that the approved design is to become the property of the Board and remain in their hands, and that "the Board reserve to themselves absolute freedom as to the appointment of an architect irrespective of the decision arrived at in the selection of the design." So that the Board may become possessed of a complete set of designs without paying a penny for them, and may then employ another architect to carry them out! To make it more complete, the intending competitors have to deposit two guineas in order to become possessed of this information, which two guineas is forfeited except on condition of making the Union a present of a design to do what they like with. The impudence of the proposal almost exceeds belief.

Richmond Isolation Hospital Competition.

THE competition for the joint Isolation Hospital for the Borough of Richmond and the Heston and Isleworth Urban District Council, to which reference was made in our columns last week, appears to be still practically unsettled. Mr. Edmeston, the assessor, placed the plans of Mr. Woodroffe first, and those of Mr. Ancell second. The Richmond members of the Committee appear to have recommended the adoption of Mr. Ancell's plans for reasons which have not been given, except in the form of a vague statement that they were more suitable "from a medical point of view." The representatives of the Heston Council have objected to this, and strongly urged abiding by the Assessor's Report, in which they are perfectly right unless any serious reason has been shown for departing from it. The matter is to come up again for discussion on Tuesday next, when it is promised that the Assessor's Report shall be laid before the meeting in full, which appears not to have been yet done. It is a somewhat significant coincidence that on the occasion of the Richmond Municipal Buildings competition in 1889, under the same assessor, the Richmond Council set aside the assessor's judgment in favour of the same architect, Mr. Ancell, in whose favour they are setting aside the assessor's award in the Hospital competition.

Advertising Architects.

A CORRESPONDENT sends us one of the most flagrant examples we have seen of the manner in which architects of a certain class endeavour to recommend themselves to the public and at the same time bring discredit on the profession. The person in question announces in an advertisement in a public paper the situation of his offices in Brighton, with the words "moderate charges" added; and sends round a printed circular stating that he is carrying on the practice of an Architect and Surveyor at the address referred to, and adding—

"It will always be my endeavour to give the utmost satisfaction at the most moderate outlay.

I respectfully but cordially invite you to consult me at all times (free of charge) upon building and allied matters in which you may be interested; my long varied and practical experience placing me in a position to render sound useful assistance in this respect."

It seems hardly likely that many persons would be taken in by such a barefaced piece of self-advertisement as this; they may be assured that an architect who would recommend himself in this fashion is one whose services would not be worth having; but it is a great pity that the Institute of Architects is not in a position to take any peremptory steps to put an end to this kind of thing. If a doctor or a solicitor issued such a circular, they would soon hear of it from the representative bodies of their professions, in an unmistakable manner.

Electric Meters, Old and New.

MANUFACTURERS of electrical meters are notoriously cynical. They do not hesitate to run down their old type of meter a few months after they introduce an improvement in their manufacture. The following extract from the pages of a contemporary illustrates this. In describing an improved meter it refers to the old one as follows:—

"Owing to the principle upon which it works it could not be regarded as satisfactory on load circuits of appreciable or high inductance. Thus on motors or arc lamps and choking coils it gave erratic readings. It has been suggested that it might, under certain conditions, run backwards. Then again, meters have been known to run on the shunt alone; . . . ."

In other words, some of the old meters go on registering when all the lamps are turned off, and we know that some can be made to run backwards. The *Electrical Review* goes on to state that a good alternating-current meter seems as far off as ever. Notwithstanding this, the London agents write the following week to complain that only "some of the improvements" of their new meter over their old one have been pointed out. This is not very consoling to the many owners of their old type of meter.

The Mansion House.

AT their meeting last week the Court of Common Council adopted a report of their General Purposes Committee for expending 7,550*l.* in redecorating the Mansion House including 3,000*l.* for the Egyptian Hall, of which the interior has not been touched since 1869. Some observations were made upon the expediency of selling the site and building a new residence on the Embankment. The present structure was built in

1739-52, after the elder Dance's designs upon the site of the Stocks Market and the former site of the church of St. Mary Woolchurch Haw. It is said that Lord Burlington supplied the design of the Egyptian Hall (90 by 59 ft.), so named from answering—in its original form—to the "Aula Ægyptiaca," described by Vitruvius.* The total cost is computed at 70,000*l.*; but large sums have been spent, and the building has been considerably altered, since. George Dance, the younger, who succeeded his father as Clerk of Works to the Corporation, covered over the open interior court for what is now the Saloon, and took down the clearstory or attic, replacing it with a semi-circular ceiling, 1795-6. The corresponding attic, on the north, above the then Ball-room—now used, we believe, as the Supper-room—was removed in 1842 by William Montague, Clerk of the Works. Meanwhile Sir Robert Smirke had re-arranged the steps beneath the main portico into two flights, east and west,† in 1843. Bunning made a new Justice-room, and set up the Doric portico over the entrance on the west side. Minor changes comprise the sacrifice of the State staircase for a second drawing-room, with State bedroom above; and the installation, in December, 1891, by the Planet Electric Lighting Company. The allegorical sculpture in the pediment tympanum is by Sir Robert Taylor. The fabric, standing on a watery soil, was built upon piles overlaid with oak planks. About thirty years ago it was found necessary to lay down concrete beneath the walls, at a cost of nearly 7,000*l.* This was done, together with extensive decorations and repairs, under the superintendence of Sir Horace Jones.

Carfax Tower.

We regret to hear that the Oxford City Council have declined Mr. Hare's scheme for treating the tower, and have returned the Report to the Carfax Improvement Committee with instructions to submit a scheme for the repair of the tower. We have already expressed our opinion on the matter, and the dilemma is very clearly stated in the words of Mr. Hare's Report to the Committee, from which the following is a quotation:—

"Carfax Tower was designed and built to form part of a church, and the lower portion has always been buried in the church, plastered over and so hidden from view. Now that the church is removed it requires no expert to see that the masonry so exposed was never intended for external work, and could not by any possibility be left in its present state. Putting aside altogether the question of appearance, it is necessary to replace that stonework for the stability and durability of the fabric. I think no one will dispute this. Now, there are two ways in which this necessary repair can be effected. The outer stones may be removed and a new facing may be inserted, leaving the outline as at present; or a casing of new work may be built on to the outside of the old stonework, leaving it practically intact. As far as I know there is no third course. I suggest that the latter method (that of casing) be adopted for two reasons:—First, because it involves the minimum of interference with the old work; and, secondly, because the tower is now seen in a way it was never intended to be seen (that is, standing alone), and it requires the extra thickness which the casing will afford at the base to give it that apparent strength and sturdiness which an independent tower should have. This admits of no discussion. It is a matter of fact from which there is no possible escape. . . . . Now, as to the upper or belfry stage. This is quite modern. It has been asserted to be a careful reproduction of the original work, and ought not, therefore, to be interfered with. This contention is, however, an entirely mistaken one, as the present belfry bears no resemblance to the old work. The masonry is of a totally different character and one unknown in Mediæval times. It is of a type known as "rock-faced," and is quite a modern invention, extremely objectionable, and destructive of all repose and breadth of effect. Further, the design and detail of the windows, string-courses, and parapet are all hopelessly bad."

All this is perfectly true, and it is difficult to understand what is the pretence for the sentimental interest which has been got up on the subject.

* See the "Vitruvius Britannicus," and the illustrations therein of Lord Burlington's Assembly Rooms at York: similar design.

† Since changed to one flight, east and west; the front railings have been removed.

The late G. E. Fripp.

Mr. George Arthur Fripp, who died on Saturday last at the age of eighty-three, was a remarkable example of a painter who preserved his powers of work almost unimpaired to a great age, and who steadily maintained the style of work in which he had made his reputation at an early date, without becoming mannered and without producing the impression of having been left behind or become *passé*, in comparison with the new men who have so much changed the style of English watercolour art in recent years. It would not be difficult to name one or two very old members of the Society of Painters in Water Colours, living or not long since dead, whose works had for many years back come to be regarded only as "survivals." But although G. E. Fripp was one of the very oldest of the exhibiting members, and though his drawings were characterised as of "the old school," he never became "old-fashioned," and down to the latest period his works were always worth attention. The secret lay in his broad simplicity of style and his fidelity to nature. There were no tricks in his art; he drew and painted landscape as it impressed him, in a style which no doubt lacked brilliancy and force in comparison with the best recent work, but which never failed in breadth, repose, and truthfulness.

BUILDING TRADES WORK AT THE BERLIN EXHIBITION.

The building trades work at this exhibition, to which we have already referred, and which has, by a curious kind of *contretemps*, been closed just as it was really completed, was collected in a section called the "Bauhof" or Building-yard (corresponding to the French "Chantier"), a quadrangular structure with frontages of various materials which were to serve themselves as exhibits of various classes of work. While the main building was of granite, stucco, and half timber work, and with its hewn timber galleries taking up one end of the square, the whole of another front was composed of a brick façade in the Romanesque style, and the two other façades of brick of different design and arrangement; all especially suited for the purpose which they had to fulfil, *i.e.*, to exhibit in full size the different manners of workmanship, material, &c., in common use in Berlin. The collection was thus a kind of record in little of practical building work in the German capital, and some of the results are worth putting briefly on record.

The principal structure is the combined work of a number of firms, each contributing its special material, in subordination to a general design by Herr Bruno Schmitz and Herr Krause. It contains two floors, the upper one a large hall showing some excellent decorative plaster work, stencilling, and some rather elementary fresco, while the floor is an exhibit of parquetry, and the windows of glazing, leading, and joinery. The carpenters also gave specimens of their crude axed work which is a local speciality. The nominal exhibits in this hall were of secondary importance, and the furniture was old work on loan. But the building is a very practical and successful manner of exhibiting the workmanship of the various trades which were concerned in its erection, though it is said that the combined result was not attained without a good deal of friction among the firms concerned.

The staircase to the upper hall was utilised to exhibit an artificial stone which admits of the steps being moulded and slightly chiselled; a material which has been largely used in Herr Sehring's buildings. On the lower floor was found tile and mosaic work, marble columns and panels, vaulting, and ironwork, of which the mosaic is the best part of the show. The porch has been utilised for various kinds of masonry and marble work, showing beautiful finish and jointing.

The hall opposite the principal building, with a brick façade towards the quadrangle, served as the vestibule for the building collection, entering it from the main transept. In this were also placed some of the principal exhibits, notably the working model of the enormous ship-lift for the new Dortmund Canal, a work which is being carried out by one of the largest contractors' firms in Germany, Messrs. Harriel and Lueg, from designs by Herr Gerdau. Another interesting exhibit in this gallery was the model of a concrete bridge for a span of 44 mètres, a model which suggested the possibility of an important economy in bridge building where the cost of transport of ironwork is high and the materials for concrete are at hand. Several models of fireproof construction were also exhibited here, but we cannot on this occasion go in detail into their merits or demerits. The cement mills, we were surprised to find, sent no large exhibit, though the stand of photographs showing the working of the Amalgamated Mortar Mills of Berlin was of considerable interest. These mills supply ready-made mortar day by day to different works in the city, by cart or canal. The organisation of these works is excellent, and the general experience is that mortar delivered from this company satisfies all requirements. The ability to obtain ready-made mortar is of great value in alterations, where space for preparing and mixing is often limited. We understand that there are other firms which supply in a like manner the various kinds of plaster required for buildings in progress.

Among the materials exhibited a large place was occupied by the various kinds of glass bricks for the construction of conservatories, allowing the free entrance of light and avoiding iron construction, with the advantage also of economy in cost. Machine-made bricks of excellent finish were to be seen, with fine sharp edges and without any of the streaky appearance frequently seen in our bricks of this class. The sharp angles, however, do not conduce to the appearance of the buildings, especially as their dimensions are larger than the average size, and this and the thin joints combined give a very hard appearance to the buildings in which they are used, though they are excellent for engineering works, and they are entirely satisfactory as to uniformity of tint.

In the masonry exhibits the brilliant finish of the German workman in the execution of capitals and carved work generally is remarkable, and is to be ascribed to the excellent training which the younger school of masons have been receiving for the last twenty years at the Technical Schools of Berlin. Tombstones and memorials exhibited serve on the other hand to show that the German mason, left to his own devices, is no better at design than his English compeers.

The variety of patent wall partitions and ceilings, intended to be of light construction but sound proof and fireproof, is greater than with us, partly no doubt due to the encouragement given by the German building law to this kind of construction, while the large number of tenement houses in Berlin give more occasion for the use of such patents than with us. The Monier and Rabitz systems appear to have given most satisfaction in Berlin. In regard to ironwork that is not of a decorative type, stable fittings were most prominently represented, but in this class of work German manufacture cannot compare with ours, even the work of the leading and favourite firms being inferior to average work of the same class in England. A practical proof of this is to be found in the fact that nearly all the important stable establishments in Germany are fitted by English firms, the Germans merely making bad imitations of English patterns. One maker actually has half his stalls paved with wood and the other half with clinkers,

so that the horses' fore feet stand on a different pavement from the hind feet; and the loose boxes convertible into two stalls are arranged so that, when they are used as stalls, the horse stands sideways to the slope of the floor.

Cooking apparatus was very well represented, and the large ranges for hotels, hospitals, &c., by German makers are very practical; their make appears to have been largely influenced by the military authorities, who have given great attention to this subject. Ranges in which the panelling is entirely of thick marble seem to be now very generally used. Gas cooking has been introduced far more widely than in this country, and in this connexion we may especially mention the excellent apparatus of Messrs. Foerster & Runge. Among the heating exhibits were also conspicuous a number of the curious corner ovens which are in general use throughout Germany, and afford ample opportunities for tile and terra-cotta makers, the various patterns and ornaments being enough to fill a whole gallery. Taken as a whole, however, the designs are not satisfactory in appearance, and the principles on which these ovens are constructed should long since have been improved.

In mosaic work for flooring, which was exhibited in the same section, the Germans made an excellent show, and turn out most finished workmanship in this material.

A PROVINCIAL OPINION ON THE INSTITUTE OF ARCHITECTS.

The following forms the main portion of the opening address of the President of the Liverpool Architectural Society, Mr. G. Bradbury, delivered on the 7th of this month, a copy of which has been in our hands since that date, though other demands on our space have prevented its publication hitherto. We think it well, however, to put it on record in our columns as an expression of the views of a certain section of the architectural profession on the question of the work of the Institute of Architects, and its relation to provincial societies and provincial architects.

After a few preliminary remarks, Mr. Bradbury's address proceeds:—"I find that the proceedings, the charter, and the management of the Institute of Architects has been a subject of great interest throughout the Kingdom, and therefore I think you will excuse me if, instead of addressing you upon art and architecture, we come down to a subject of very grave importance and practical utility, and consider for a short time what may be said for and against the Institute.

Your Society has seen fit to enter into alliance with the Institute, under which it becomes 'the accredited centre of the district and the agent of that district, in this relation with the heart of this system in London.' These are the words used by the Institute's President in his address at the opening of the session 1893-4. Further, you have agreed that 'The constitutional rules or by-laws of allied societies shall be subject to the approval of the Council, and that no addition thereto or variation thereof shall be made without previous notice to, and approval by the Council.' If your President happens to be a member of the Institute, then he has a right to attend the meetings of the Council of the Institute. Now, gentlemen, this appears to me a very advisable and proper alliance for your Society to have adopted. I think every one will admit that in these days of great competition it is exceedingly advisable that there should be a central authority in London that should look after and guide the education of those who intend to follow our profession; that should collect and purchase books and establish a library for the attainment of knowledge; that should call meetings and arrange to have papers read on subjects of interest to their members; that should publish their proceedings in a journal and take note of everything relating to legal decisions and other matters useful to the architectural profession. Now all this the Royal Institute has done in the past and is doing in the present. Its system of education through the Architectural Association is probably as fine a one as can be devised for London. In Liverpool there are many members of our profession who think the mode of examination capable of very great improvements. Mere cramming the mind with a large number of facts, dates, and names of celebrated architects of past ages, will never produce an architect, but it may make a good historical architectural writer or archæologist, but this knowledge although of a certain amount of benefit will never teach him to design plans suitable for modern requirements. The whole system of education at the present time throughout the kingdom, even in our Board Schools, colleges, and universities is undergoing a change. The professors and teachers, instead of cramming their pupils with a vast store of book-knowledge which is probably forgotten as soon as the examination is over, are now endeavouring to find the strong points and the individual abilities of their pupils, and to encourage them to work and think out for themselves problems in life which may be presented to them.

With all these advantages is it not strange that out of about seventy-eight members of your Society only twenty-four are subscribing members of the Institute?

To obtain further enlightenment I attended with Mr. Culshaw the Manchester Conference, held on May 20, when an address was read by Mr. Henry Salomons, touching the 'Mutual Relations between the Local Affiliated Societies and the Parent Body in London.' The great point of that address was the 'most important benefits resulting from the relationship of more frequent personal intercourse between non-metropolitan societies and the Royal Institute, whereby provincials got their views enlarged by the experience of those at the head of the profession, and thus improved the standard of our work.' A great deal was to be obtained by social intercourse and such a gathering as that at which we are now assisting. But I cannot see where the benefit is derived by your Society, as a body, in sending your President, whoever he may be, to Manchester or London to eat a dinner. You may say that the President attending the meeting of the Council in London and meeting those from allied societies would bring back information which would be of value to the whole of his professional brethren; but this is not so, for I read in the address delivered by Mr. William Henman, the President of the Birmingham Architectural Association that attended three meetings of the Council of the Royal Institute of British Architects, yet on none of these occasions he said, 'Have I met any of the representatives of a provincial society, although there are eight who are members of the Council, and there are fifteen societies in alliance with the Institute.'

It was remarked at Manchester that people asked what benefit they would derive by becoming Fellows of the Institute, although there were many highly interesting addresses delivered as to why all the architects in the provinces should become members. I am sorry to say they only appear to me to be Fellows to a great extent on sentimental grounds.

The President of the Manchester Society said that 'it seemed to him that architects must follow all other professions or businesses in one thing.' There must be co-operation or 'trade unionism,' as Mr. Golthart had called it. Now, with those words, gentlemen, I must cordially agree, that is to make the Royal Institute of British Architects, in profession and in practice, a 'trade union.' You may not like the words, but alter them to any other you prefer, but let the union of self-protection and advancement in knowledge, and in brotherly calling be the watchwords. All the great and learned professions have some system of union. Medical men have to obtain certain degrees and pass certain examinations before they are allowed to administer even the simplest form of medicine to a patient. The solicitors have to pay a high premium and serve five years and pass an examination before they are allowed to practise. Even the accountants have had to amalgamate, and now use the word chartered. There is not a single artisan that is employed to carry out our works who does not belong to one trade union or another, even down to the lowest-paid labourer.

To bring this about there will have to be great changes in the Institute. For the admission of a student an exceedingly moderate fee per annum should be demanded, and he should be supplied with all the printed matter issued from the Institute, even if it cause a slight loss. He should, in my opinion, be registered as an Associate when he has completed a certain number of years of study either at a recognised art school or college, and after passing an examination of not too severe a character, and more of a practical nature than of mere historical knowledge. An Associate's subscription should not be, for the provinces, more than 1*l.* 1s. It should, in my opinion, be the aim of the Institute to enrol the whole of the architectural draughtsmen. The election of Fellows should be entirely in the hands of the Council, and all Fellows of provincial societies should be elected as Fellows of the Institute on making the ordinary and requisite declarations. Their subscription should not be more than 2*l.* 2s., and I think if you wished the 'trade union' idea to be carried out, the entrance fees should be done away with. This question of election was in the minds of the Congress in Manchester, and it was remarked that there are many outside the Institute who ought to belong to it.

Mr. Holden said that 'he could quite understand that a gentleman who had been in practice twenty or thirty years would say, "I would sooner remain as I am than place myself in a position of being voted upon by gentlemen who have passed through my office and some of whom may be in my office now"—no doubt referring to the Associates who now have considerable power in the election. Mr. Slater said that he felt very strongly on the subject, and if there was a possibility of a repetition of what had occurred a year or two ago when some very eligible men were blackballed for no fault of their own, by people who he believed knew nothing about them, 'then the Council,' he said, 'ought to take steps to alter the by-laws and limit the election of Fellows to Fellows themselves.'

If these are the views of the Fellows in the Institute, what must be the views of those outside?

On the financial view of the question I should like to give you a few facts. The contribution by the members of the allied societies of the Institute in 1895 was, I believe, about 80*l.* The Institute returned to the allied societies one-fourth of the subscriptions; say 20*l.* What benefit, I should like to ask, have the allied societies gained by giving the 60*l.* to the Institute; or taking our Liverpool Society, fifteen Fellows at 4*l.* 4s. each, and ten Associates at 2*l.* 2s. each, gives a total of 84*l.*, of which one-fourth (21*l.*) was returned to the Society? What benefit does the Liverpool Society or the architectural profession reap from this expenditure of 61*l.*? In London, it may be said, you can obtain the advantages of the Institute Examinations, but I am not sure, gentlemen, if we cannot boast of having in Liverpool a school of architecture established at the University, that gives to our students a superior system of education than that given by the Association of the Institute in London. I think and hope in years to come that the certificate granted by the college will count as high as any that has ever been given in London. The total number of students attending all the various classes in architectural drawing, modelling handicrafts is very large, and I have no doubt you will be pleased to know that I have the authority of Professor Simpson to say that the school is now in a very flourishing and satisfactory condition. The college has a small but architectural library, and a very considerable sum of money is now being expended upon architectural casts. We have in the public library one of the very finest collections of architectural books in the kingdom. So extensive is the number of the books that a special catalogue has been issued which contains the names of 1,070 volumes devoted to architecture alone. There is a similar catalogue issued on building construction, making a total of about 1,453 volumes appertaining to our profession alone. The 'Journal of the Institute' we can read in the Free Public Library.

My view, therefore, is that until the Institute have amended their charter and by-laws so as to make it possible for every practising architect and those associated with him to become members, it is useless for us to look to London for guidance in our profession; but rather that our efforts, energies, and, what is not of so much importance, our money, should be devoted to helping forward and encouraging all our local efforts, which, I feel you will all agree with me, are now, and will be in the future, second to none in the kingdom.

If this idea of professional Unionism is brought about in the next ten or fifteen years, an absolute and visible effect will be seen. I feel we shall have done very much towards doing away with that great incubus of our profession—I mean the competitive system. What, gentlemen, can be more lowering to our profession, to the dignity of our profession, whose members have to construct homes in which the lives of its citizens must be passed, and in the schools at which the young are taught, than to find an advertisement like that of the Bootle School Board, inviting competitive plans from the architectural profession without offering any premium whatever for any of the designs sent in; but, on the other hand, the committee who have charge of the education of the district demand from every architect who wishes even to know what the conditions will be a fee of 2*l.* 2s. A charge of 1s. would have been ample for such particulars, and would have more than paid for the cost of printing.

They desire not only to pick your brains, but

Part of Detail of Park Gate.—Designed by Mr. R. T. Blomfield.

your pockets as well. Are there no architects in this neighbourhood fit to design and honestly capable of erecting a Board school, without entering upon this wretched competitive system, which is neither satisfactory to the architect or the proprietor, as it nearly always leads to misunderstandings on such matters as cost. Another growing evil, and a great danger to our profession, is that large firms and limited liability companies now undertake the erection and the furnishing, including the whole of the plans of houses, mansions, and public buildings. There are instances known in our profession where furniture removers have offered to supply designs for additions, and stables, and other out-buildings, free of cost; and even where there was an architect already employed upon the work.

I need not enlarge to you by further illustration what a great benefit the Institute could become if worked on the lines I have suggested. The total number of members in all classes in 1885 belonging to the Institute was 2,504. This is probably a mere fraction of those calling themselves architects, probably not more than one-tenth. If the Professional Union could enrol one-half of those calling themselves architects throughout the United Kingdom I feel sure they would have a body of at least 10,000 members. They then could pass a by-law that all competitions shall be carried out under the rules of the Institute or the members of the Institute decline to compete; they could pass the resolution that the members of the Institute would decline to receive contracts from building contractors, decorators, furniture removers who supply plans and carry out architectural works on their own account. There are many other similar regulations which they could enforce of vast benefit in my opinion to the profession. I must apologise for having detained you so long on this subject, but it is a legacy left over to me by your former President. I had no idea when accepting this position of the mass of correspondence and the literature I would have to peruse on this subject, and I have felt compelled to ask you to take the matter into your serious consideration, and that all the members of the Council of the Liverpool Architectural Society or Fellows and Associates in Liverpool of the Royal Institute of British Architects, will do their utmost to attend a meeting called for to-morrow, at two, to take into consideration letters and correspondence with the Institute on the question of the election of Fellows. The reply from your Society is required to be received by the Institute before the 12th inst. The Birmingham Society has very kindly, and with the utmost courtesy, sent us their views on the interim report on the subject.

For the present I particularly desire you to

Park Entrance Gates.—Designed by Mr. R. T. Blomfield.

consider the views I have expressed this evening as entirely my own. I cannot hope or think they will all be approved or even adopted by your own members as a society, but with your permission I will read to you a few words addressed by Mr. Alfred Waterhouse, F.R.I.B.A., LL.D., R.A., Gold Medallist, and President 1888-1891, who said at Manchester that he believed that members of the Institute might very safely agree not to take part in competitions except among themselves. He thought the Institute must make a great change in the mode of electing Fellows, and concluded by giving the reasons which should induce architects to become members of the Institute. It was not merely a question of whether they were to derive individually certain advantages by becoming members of the Institute, but whether by joining the Institute they could so advance their art and the profession to which it was an honour to belong."

DESIGN FOR PARK GATES AND RAILING.

THIS design is the one by Mr. R. T. Blomfield, carried out by Mr. Thos. Elsley, the centre portion of which is in the Central Hall at the Arts and Crafts Exhibition. The small drawing shows the whole design, the larger one a portion of the detail, reduced from the full-size drawing.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, Sir Arthur Arnold, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee it was agreed to lend the Shoreditch Vestry 29,655*l.* for a dust destructor and electric lighting works, the Islington Vestry 11,565*l.* for wood-paving work, the Strand Guardians 1,350*l.* for the purchase of freehold property in Bear-yard, the St. Marylebone Burial Board 4,000*l.* for works and the purchase of land at their cemetery at East Finchley, and the Asylums Board 75,745*l.* towards the erection of the Park Hospital.

Arbitration as between Works Department and Certifying Officers.—The report of the General Purposes Committee contained the following paragraph:—"On July 21 last the Works Committee, in submitting accounts for jobbing works completed during the year ended March 31, 1896, reported that there were six accounts outstanding, with regard to which the manager and architect had not been able to come to an agreement, and on the recommendation of the Committee the Council referred it to the General Purposes Committee to settle the points in dispute. On July 28 the Council passed the following resolution, viz.:—

'That the principle of the clause adopted by the Council on July 7 for its building contracts, by which a reference is allowed to an independent arbitrator in certain cases of dispute between contractors and the certifying officers of the Council, be applicable to the settlement of any questions that may arise between officers of the Works Committee and the certifying officers of the Council in connexion with works carried out by the Works Committee.'

Consequent on the passing of the above resolution, the Works Committee have asked us to take steps to appoint an arbitrator to settle the points at issue with regard to the jobbing works above referred to. Before we could act on the request of the Works Committee it was necessary for us to consider the best method of giving effect to the resolution of the Council with regard to arbitration, and after going carefully into the matter, and receiving a report thereon from a sub-committee specially appointed for the purpose, we are of opinion that, with a view to applying the principle of outside arbitration in the case of works carried out by the Works Committee, it is desirable that in each case the points of final difference between the officers of the Works Department and the certifying officers of the Council should be reported to the General Purposes Committee, and that that committee should be empowered to give the necessary authority for the arbitration, and appoint an arbitrator after receiving agreed nominations from the officers of the Works Department and the certifying officers of the Council. We accordingly recommend:—

'That, with a view to applying the principle of outside arbitration in the case of works carried out by the Works Committee, the points of final difference between the officers of the Works department and the certifying officers be reported to the General Purposes Committee, and that that Committee be empowered to give the necessary authority for the points in dispute to go to arbitration, and to appoint an arbitrator after receiving agreed nominations from the officers of the Works department and the certifying officers.'"

After an amendment to refer the matter back had been defeated, the recommendation of the Committee was agreed to.

Somers Town Improvement.—The Improvements Committee submitted a report stating that the Somers Town scheme prepared by the Housing Committe provided *inter alia* that a narrow footway known as Churchway, extending from the Euston-road to Drummond-street, should be widened to 40 ft. between Drummond-street and Grafton-place, and that the southern portion between Grafton-place and Euston-road should be closed. The Vestry of St. Pancras had asked that the southern portion, which was a narrow and partly covered passage, only about 6 ft. wide, might also be widened to 40 ft., the road being thus carried through to Euston-road. The Committee thought the Vestry's proposal should be adopted. The estimated cost of the work was 7,600*l.*, and the Vestry was prepared to pay half that amount. On that condition the Committee recommended that the work should be carried out by the Vestry.

Mr. Leon moved an amendment to refer the report back. The improvement, he said, was a local and not a metropolitan one, and if carried out at all, it should be at the expense of the Vestry.

On a division the amendment was carried by 46 to 41.

Heath Asylum, Bexley.—The following report of the Asylums Committee led to a long debate:—

"We have to report that with a view to the erection of the first part of the superstructure of this asylum in the most speedy and economical manner, blank bills were recently sent to the Works Department, with an invitation to them to fill in prices for the work. After examination of these prices by the architect, Mr. Hine, and the quantity surveyors, we were unable to accept them. In these circumstances we decided to invite tenders from contractors. Twenty-two firms were asked to tender, of whom six declined the invitation, and five decided thereafter not to do so, in consequence of the conditions of contract. Eight tenders, however, were received as follows:—

J. Parnell & Sons, Rugby	£90,756
Henry Lovatt, Wolverhampton ...	91,879
John Shillitoe & Son, Bury St. Edmunds	95,000
Foster & Dicksee, Rugby	95,550*
Leslie & Co., Kensington	99,772
Estcourt & Son, Gloucester	101,800*
Kirk & Randall, Woolwich	114,435*
Patman & Fotheringham, Theobald's-road	117,500*

Messrs. Parnell & Son, whose tender was the lowest, had omitted to fill in the rate of wages and hours of labour in Part II. of the schedule (outside the London radius), and when requested by us to rectify their omission, they withdrew their tender unconditionally. Mr. Lovatt's tender is, therefore, the lowest, and is well within the architect's estimate. He desires to sub-let the tar-paving, granolithic work, wood-block flooring, slating, plastering, ironwork, plumbing, and glazing, and the necessary permission will be given him subject to the conditions of contract. The expenditure under this contract will form part of the sum of 350,000*l.* authorised by the Council to be expended for the erection of this asylum. The inquiries made as to Mr. Lovatt are quite satisfactory, and we therefore recommend:—

'That the tender of Mr. Lovatt, amounting 91,879*l.*, for the first part of the superstructure of the Heath Asylum, be accepted conditionally on the approval of the Secretary of State being obtained thereto, and that it be referred to the solicitor to complete the contract.'"

Mr. Boulnois, M.P., asked the Chairman of the Committee whether any report of the probable capital expenditure which the Committee was likely to incur in the next few years had been or would be prepared for the Finance Committee. Also, whether he could give for the information of the Council a return showing the estimated surplus or deficiency of beds for asylum patients for the next five years, having regard to the additional accommodation which the Council had agreed to provide.

Mr. M'Dougall replied that the expenditure contemplated by the Committee was—for the asylum at Bexley, 350,000*l.*; for increased accommodation at Hanwell, 40,000*l.*; for temporary accommodation at Horton Manor, 100,000*l.*; and for an asylum at Horton Manor, 350,000*l.* There would also be the furnishing of these places, about 100,000*l.* Therefore, in addition to the 350,000*l.* already sanctioned for the Bexley Asylum, it was contemplated to expend about 600,000*l.* within the next five years. At the end of the year they had 13,466 patients, and they had accommodation for 12,469, leaving a deficiency of 997 beds. If they carried out the programme which they proposed they would at the end of five years have about 500 beds to the good, *i.e.*, in excess of the estimated requirements.

* These tenders are subject to modification of the conditions of contract.

Mr. Roberts moved an amendment to refer the report back. The list of tenders contained the names of some firms of high standing, and they strongly objected to the conditions of contract imposed upon them by the Council. One condition he would refer to was as to the responsibility for the foundations of the proposed asylum of the builder whose tender for the superstructure was to be accepted. Those foundations had been carried out by the Works Department, and it was not fair to a contractor to make him responsible for them. One result of such conditions was that contractors who were willing to take the risk imposed by the conditions increased the amount of their tenders in order to cover the risk, and the Council and the ratepayers had to pay in the end.

Mr. Steadman seconded, and complained that the Works Department had not been treated fairly in the matter by the Asylums Committee.

Mr. J. Burns, M.P., also contended that the Works Committee had not had fair play in this matter from the Asylums Committee. The Works Department would have been able to do the work for about 94,000*l.*, which was about 1 per cent. above the price of the tender it was proposed to accept. If the work had been given to the Works Department it would have been well done, and employment would have been given to a large number of East End workmen. For the sake of 1 per cent. the Asylums Committee were going to send 94,000*l.* worth of work to Wolverhampton.

Mr. McDougall said he admitted that the foundations were extremely well done, and he would have been glad if the Works Department could have done the whole of the work, but they found that the standing orders did not permit their giving the work to the Works Department. He denied the statement made by Mr. Burns that contractors were allowed to sub-contract without permission. He believed that the Works Committee were the only persons who sub-contracted without permission. The Asylums Committee had no knowledge that the Works Committee could have done the work for 94,000*l.* It was believed by the architect that the schedule of prices for the superstructure sent in by the Works Committee would go beyond the estimate.

Mr. Ward, Chairman of the Works Committee, complained that the Asylums Committee had adopted a new system of asking for prices, instead of asking the Works Committee whether they could do the work within the estimate.

Mr. White, Vice-Chairman of the Works Committee, said some members of the Council seemed to desire to let the Works Committee have work, no matter how much it might cost. No prices came before the Asylums Committee from the Works Department, but merely a rough schedule of prices, which, the architect advised them, would work out above his estimate. Somehow or other the prices submitted by the contractors leaked out, and immediately it was stated that the Works Department would do the work for 92,000*l.* or 94,000*l.* It was also a strange thing that, while the specification provided that the contractor should accept the responsibility of the foundations put in by the Works Department, when that specification was submitted to the manager of the Works Department he struck that provision out. Mr. Burns had objected to the sub-letting; but the fact was that, in the largest job the Works Department ever did for the Council, the joinery work was done by a firm in Gloucester. The foundations at Bexley, he believed, were well done—as well as a contractor would have done them, perhaps, but not better.

Mr. Thornton said the reason that some of the work at Colney Hatch was obtained from Gloucester was because the Council insisted upon the work being completed within six months, and it was absolutely impossible for the Department, with the means at their disposal, to do it themselves within the time.

Mr. Nathan Robinson said that hitherto he had always voted in favour of the Works Department, but as a member of the Asylums Committee he felt bound to accept the very decided statement of the architect, that the schedule of prices submitted by the Works Department would involve a reckless expenditure of public money.

The debate was continued by several other speakers, and the Council divided with the following result:—

For the amendment	29
Against	67

Mr. Hoare moved a further amendment, that, in accordance with the Standing Order, the Council should execute the work without the

Sketches of London Street Architecture.—VII. Headquarters of the Victoria and St. George's Rifles. Mr. C. H. Shoppee, Architect.

intervention of contractors, and that the specification and estimates should be referred to the Works Committee.

Mr. Ward seconded, and said he had information that if the Works Committee had been shown the bills of quantities in detail their estimate would have been considerably less than the architect's estimate.

Mr. Burns, M.P., in supporting the amendment, said that all the Works Committee required was free and open contracting, and that if they could do the work as well, and he believed they could do it better than a contractor, their right to the work should not be disallowed. He objected to the way in which members of the Council were constantly jockeying the Works Committee, and he repeated that in this matter that committee had not had fair treatment.

Mr. White protested against the attempt to put the works into the hands of the Works Department, especially now that the prices tendered by the contractors had been published.

Mr. Roberts said it was impossible for the Council to go back now and refuse to give the contract to the successful tenderer, however much the Asylums Committee had blundered in relation to the Works Committee. He hoped that the

Council would take into consideration the question of altering the conditions of contract so as to make them more equitable.

Mr. Hoare then withdrew his amendment.

Mr. Taylor moved a further amendment refusing permission to sub-let the plastering or plumbing work, but this was rejected without a division. The Committee's recommendation was then agreed to.

Mill-lane, Deptford, Paving Scheme.—On the recommendation of the Housing of the Working Classes Committee, it was agreed that the supplemental estimate of 194*l.* in respect of the sewer and paving work in connexion with the Mill-lane, Deptford, scheme, under Part II. of the Housing of the Working Classes Act, 1890, submitted by the Finance Committee, be approved, and that the plan, specification, and revised estimate of 1,968*l.* be referred to the Works Committee with a view to the execution of the work without the intervention of a contractor.

New Engines, Crossness Outfall.—The Main Drainage Committee recommended, in reference to new engines at Crossness Outfall, that the estimate to be submitted by the Finance Committee in respect of new engines at the Crossness Outfall be approved by the Council; that the tender of Messrs. Fleming & Ferguson, Limited, of Paisley, amounting to 34,350*l.*, for the construction, delivery, and erection of two triple-expansion vertical-cylinder engines and accessories at the Crossness Outfall be accepted, and that the solicitor be instructed to complete the contract.

New Recreation Ground.—The Parks Committee recommended:—

That the Council do agree to the acquisition of certain land belonging to the governors of Guy's Hospital at Nelson-street, Bermondsey, at the price of 4,600*l.*, and to maintain the ground when acquired, conditionally upon the Vestry of Bermondsey and other local bodies contributing the sum of 2,300*l.* towards the purchase-money, and to the laying-out works being carried out at the expense of the Metropolitan Public Gardens Association, and subject to any necessary Parliamentary power being obtained; and that in consequence of the urgency of the matter, the Council do refer it to the Parliamentary Committee and the solicitor to take the necessary steps in the matter at as early a date as possible.

After some conversation, the recommendation was agreed to.

Sanitary Inspectors. — The Public Health Committee reported that the Local Government Board has sanctioned the appointments of Mr. J. P. Follard and Miss Annie Elliott as Sanitary Inspectors in the parishes of St. James, Westminster, and St. George-the-Martyr, Southwark, respectively. The total number of Sanitary Inspectors in London, so far as can be ascertained from the information in the possession of the Council, is at present 242.

Street Noises.—Colonel Ford moved that the Local Government and Taxation Committee should consider and report, with a view to the mitigation or suppression of such street noises as constitute a public nuisance.

This was agreed to without discussion, and the Council adjourned.

SKETCHES OF LONDON STREET ARCHITECTURE.—VII.:

HEADQUARTERS OF THE VICTORIA AND ST. GEORGE'S RIFLES (1ST MIDDLESEX).

The above headquarters (completed in 1890) were erected for the St. George's Rifles, now the Victoria and St. George's Rifles, and occupy an important site in Davies-street, Grosvenor-square.

The building provides the regiment with a suitable drill-hall, armoury, gymnasium, Morris-tube gallery, recreation-room, colonel's and officers' rooms, &c., also the requisite accommodation for the regimental staff.

The drill-hall is about 90 ft. in length and 57 ft. in width, and has an open roof with steel principals and a lantern light.

The masonry to the front is of Portland stone, the columns to the entrance of red Peterhead granite, and the facings of red pressed bricks.

The front roof is covered with Broseley tiles, and the turret and cupola with copper.

The figures in the pediment of the entrance porch, viz., St. George and the Dragon, were modelled in terra-cotta by Lieut. G. E. Wade (one of the former officers of the St. George's Rifles).

The floors are of fire-proof construction throughout.

The architect under whose direction and from whose designs the works were carried out was Mr. Charles Herbert Shoppee, of London, and the general contractors for the works were Messrs. E. Lawrence & Sons, City-road.

THE TROCADERO RESTAURANT.

This building, which was opened two or three weeks ago, has been specially planned, erected and equipped to meet the requirements of the business, special attention having been given to the kitchen department and the service kitchen upon each floor.

The building contains nine floors. The sub-basement is occupied by wine cellars, dry goods warehouse, beer and mineral water cellars, staff dining-room, and two large lifts, the one from the goods entrance on the ground-floor to the sorting-room, from which the other distributes the goods after being unpacked. The remainder of the sub-basement is occupied by boiler-room and engine-room. The engineering arrangements are exceptionally complete. In the sub-basement there are two large locomotive-type boilers, which supply steam for cooking apparatus, refrigerator pump, pneumatic pump, and three large Berriman heaters, which supply the premises with hot water and serve the heating apparatus.

In the adjoining engine-room is a main switch-board for the electric light arrangements, and electric and steam pumps and air containers, and in a room at the back of the boilers refrigerating plant is being erected. By means of this plant the wine and beer cellars will be controlled, and by the same apparatus mineral waters will be kept at a suitable temperature. There is communication from the wine cellar to each floor by means of a shoot, down which orders are passed in "carriers," and deliveries from the wine cellar are made by six electric lifts, each lift serving one floor only. By this arrangement it is impossible for wine to be removed from the lifts at any floor except the one at which the order was handed in. By an ingenious arrangement the electric wine-lifts can, in a few seconds, be converted into hand-power lifts.

Upon the basement floor is a large grill-room 82 ft. by 40 ft., and a smoking-room 41 ft. by 29 ft. These rooms have a separate service and a large auxiliary kitchen, with connexion by a food-lift to the main kitchen on the fourth floor, and its own wine-service lift to the cellerman's office in the wine cellar. The grill-room is approached by a 7-ft. wide marble staircase, which leads to the side entrance in Great Windmill-street, and to the main entrance hall. On this staircase is a handsomely-fitted gentlemen's lavatory. Other communication to this floor is obtained by a large (Waygood's) passenger lift. The grill-room on this floor is finished in the Flemish Renaissance style, the walls panelled in different coloured marbles, having ormolu mounts. The ceilings are coffered in modelled plaster. The remaining space is occupied by staff dressing-rooms and lavatories, &c.

The ground floor is approached by the entrances from Shaftesbury-avenue and Great Windmill-street to a hall 40 ft. by 26 ft., from which access is obtained to the principal rooms on this floor—viz., the restaurant, 67 ft. by 40 ft.; the saloon, 54 ft. by 28 ft.; and the buffet, 22 ft. by 21 ft.

Marble staircases from the hall lead to the upper floors and the grill-room in the basement; they are 9" good width and the steps arranged in short flights. A frieze, designed and executed by Messrs. Moira & Jenkins, enriched with bright metals and colours, surrounds the hall. It illustrates the salient points of the Arthurian legend—Launcelot bringing Queen Guinevere to Camelot; a pavilion outside Camelot, with its preparation for the bridal; a mediæval hawking scene; knights on horseback, and a banquet scene at the assembly of the Knights of the Round Table are the subjects of the principal panels. On this floor centrally, as well as to all other floors, are arranged large services, which contain wine dispensary and service kitchen, each being fitted with electric lifts from the main kitchen and wine cellar; while the goods lift, which travels from the sorting-room in the basement, delivers to each level. The service consequently is arranged so that it may be of the quickest. Telephones, speaking and pneumatic tubes for the conveyance of orders, &c., are also fitted to each service. This floor is decorated in the Louis Quatorze and Louis Quinze styles.

The mezzanine floor provides for reception and Masonic lodge rooms, and from the main landing of the staircase the balcony of the restaurant is reached.

The first, second, and third floors are planned with wide, well-lighted central corridors, having handsome private dining-rooms arranged on either side, retiring-rooms on each level being also provided. The second floor contains, in addition, a very large ball-room or banqueting hall, 67 ft. by 40 ft., decorated in the Empire style in dark mahogany, with ormolu mountings, and richly panelled in green silk. The prevailing colouring throughout the building is white and gold, although other colours are employed.

The kitchen is on the fourth floor, 48 ft. by 40 ft., centrally situated, and leading off from it are pastry kitchens, pot scullery, pastry bakery, ice-making room, ice store, dry larder, vegetable room, chef's room, meat larder, fish and poultry larder, plate room, cooks' lavatory and dressing-room, kitchen clerk's office, &c. The lift-service room adjoins the kitchen clerk's office, in which a system of pneumatic tubes has been installed by which orders from each floor are delivered to this office in a period of about three seconds, the waiter placing the order in a carrier which is instantly despatched by compressed air and delivered into a basket at the kitchen clerk's desk. To prevent a possibility of the failure of this apparatus there is a large compressed air container, as well as steam and electric pumps for compressing the air. Adjoining the kitchen clerk's office is a lift service room, from which nine electric lifts serve the different floors. These lifts are constructed on a similar principle to the electric wine lifts, except that the motors have had to be erected in a very limited space immediately above the well. The cages are self-stopping when they reach the floor served. In addition to the electric lifts there are three hydraulic lifts, one for passengers and two for goods.

The cooking apparatus in the kitchen consists of hot plates, hot closets, vegetable steamers, steam-jacketed sinks, steam-heated kettles, steam-heated stock pots, &c., and other apparatus of the usual type, with the exception that hot closets and hot plates are constructed of wrought steel instead of cast iron, as is generally the case, and many of the hot closets in the service rooms adjoining public rooms have glazed hot cupboards above. In the kitchen there is a novelty in the form of a spit and broach driven by electric power, with complete arrangements for varying the distance from the fire of the article being cooked. As the kitchen is immediately above the ball-room, special precautions have been taken to prevent sound from the kitchen finding its way to the ball-room, and also to prevent moisture percolating through the floor.

On the fifth floor are linen stores, linen-mending rooms, and lavatory accommodation for the women staff.

The stonework of the elevation is Dumfries stone, the style "modern" French Renaissance. The Shaftesbury-avenue angle of the front is marked by a high tower, and the entrance on the ground-floor level is executed in Devonshire marble, the caps to the columns being bronze. The carving has been executed by Mr. F. L. Jenkins, and the marble work of the exterior by Mr. Jenkins of Torquay.

For the heating arrangements, ventilating radiators of the Bundy type are provided, and as in many cases exhaust ventilation cannot be obtained through walls and windows owing to adjoining property, ventilating air trunks worked by exhaust blowers have been provided, the grill room, which is entirely below the floor level and adjoining offices, being ventilated by this method.

The floor construction is fireproof, the steel and ironwork being carried out by Messrs. H. Young & Co. Messrs. Hawkins & Baxter and Clement Jeakes & Co. supplied the kitchen cooking apparatus. Mr. J. Jeffreys was responsible for heating, &c.

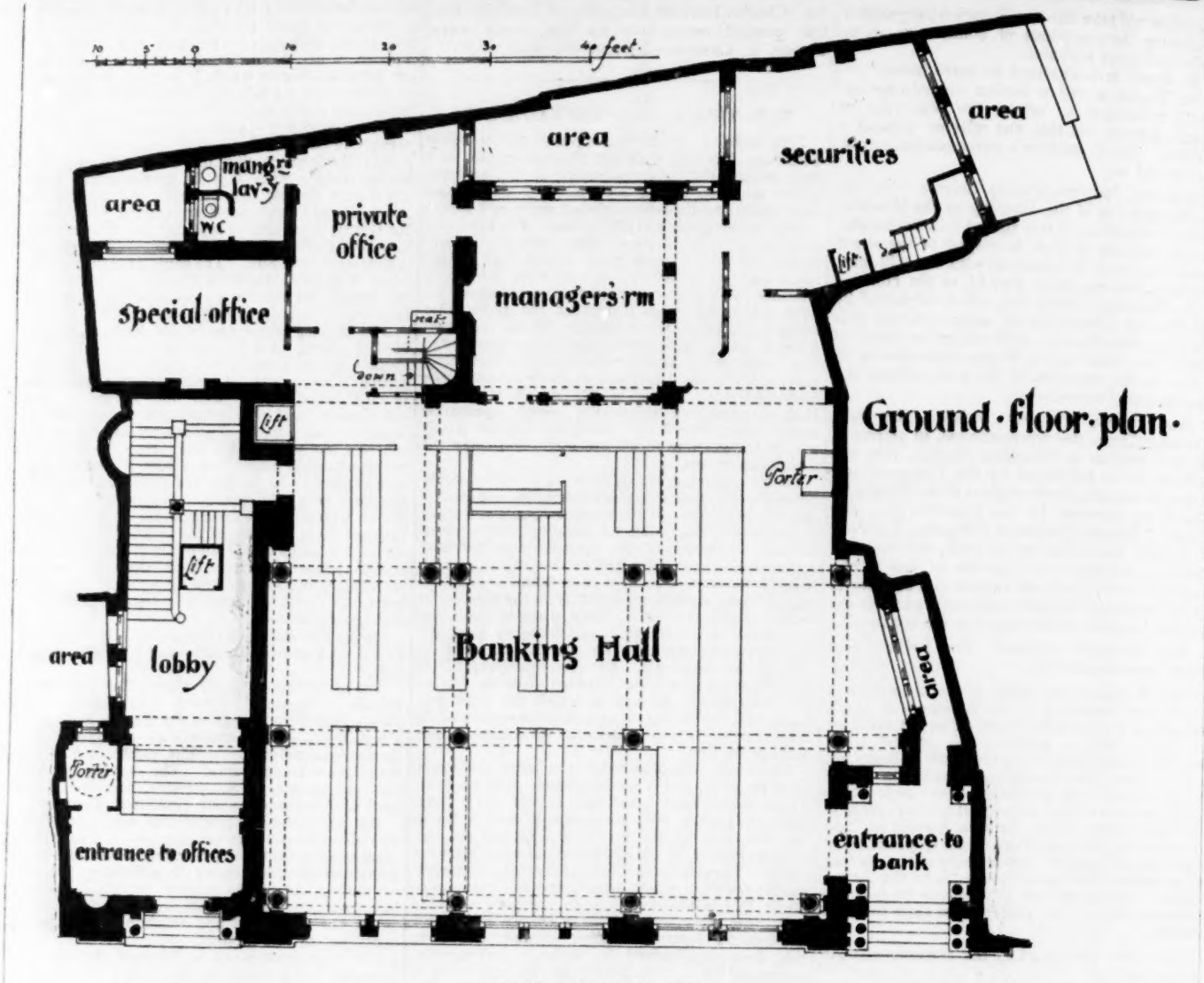
The sanitary fittings, which are of the most elaborate description, were put in by Messrs. B. Finch & Co., and the magnitude of the work in this department alone will be understood when we say that the piping of various sizes measures 6,150 ft. and weighs 12 tons 15 cwt., and that upwards of 27 cwt. of plumbers' solder was used. Every part of this enormous length of piping can be immediately inspected, as at all bends and at every trap screw inspection caps are fitted. All sinks and lavatories are removable in case of stoppage, a plumbers' union being inserted with this object. Messrs. Finch's patent syphonic closets have been used throughout.

All soil-pipes are in 8-lb. lead, fastened with ornamental cast-lead tacks. Each soil-pipe and sink and lavatory waste has a separate vent-pipe. All the kitchen sinks on the top of the building discharge into two separate waste-pipes that run down to the basement, no other connexion being taken into them. There are three cisterns. The main one in the roof supplies all fittings down to the ground-floor. From a T-piece under the main tank two 2½-in. full way stop-cocks are fixed, two separate services of 2½-in. heavy lead pipe carried down to the mezzanine floor, the one to serve closets, lavatories, and urinals, and the other the sinks. Full way stop-cocks are fixed on each branch to the sinks and each sanitary fitting. In the wine bars a separate waste is run, the sinks here having three services, viz., hot, cold (from store-tanks), and drinking water direct from the meter.

The lavatories are decorated with enamelled metal wall and ceiling decorations by the Enamelled Metal Decoration Company. The electric lifts are by Messrs. Easton, Anderson, & Co.; the ornamental wrought-iron work by Messrs. Jones & Willis, and the interior marble work by Mr. Van Brabant.

Messrs. J. Lyons & Co. were their own general contractors for the erection of the buildings, the whole being designed and carried out under the directions of the architect, Mr. W. J. Ancell. The engineer is Mr. Martin Roberts, and the decoration of the interior was carried out for the Company by Mr. C. W. Oatley.

The electric light installation has been carried out by Messrs. Strode & Co. on a novel system, viz., by carrying all electric-light leads through iron tubes, lined with an insulating material com-



Bank of Scotland. Plan.

posed of bitumen, with inspection boxes and junction boxes fixed in such positions that any wire can rapidly be withdrawn and replaced. By this method not only has the risk of fire been reduced to a minimum, but the decorations are not disfigured by any exterior casing, and the work of installing electric-light leads was able to proceed without risk of injury during the progress of the building. The wiring throughout is on the three-wire system, half of the illumination for each large room being taken off opposite sides of the system, so that in the event of a fuse going, not more than half the lights would be extinguished. The exterior illumination of the building is by means of fourteen arc lamps.

Illustrations.

S. VITALE, RAVENNA: SECTION THROUGH CHOIR.

THE illustration of a portion of the details of this celebrated church is from a coloured drawing by Mr. J. J. Joass, exhibited at the last Royal Academy exhibition.

The original mosaics have disappeared except in the choir and apse. These are fine examples of work of the sixth and seventh centuries, and differ from the late mosaics of Venice and Sicily in the sombre blacks and green of the background, where in the late examples gold was chiefly used.

The subject in the Lunette is Abraham entertaining the angels, on the left, and on the right the sacrifice of Isaac; in accordance with the frequent practice in early art of representing various incidents of a story in the same picture. Above are the Evangelists Luke and John, Matthew and Mark being on the other side.

BANK OF SCOTLAND.

THE new bank premises for the London branch of the Bank of Scotland are built on a site in Bishopsgate-street Within, formerly occupied by what was known as Crosby Hall Chambers and the adjoining property to the north, opposite to the National Provincial Bank of England, the frontage being 97 ft., depth 85 ft., and area about 7,400 ft.

The façade in Bishopsgate-street is in Portland stone, with Norwegian porphyry columns, arches, &c., to the entrances, supplied by Messrs. Fenning & Co., the spandrils being filled in with bronze figure subjects representing England and Scotland, Edinburgh and London, the mullions to ground floor windows and grilles and gates to entrances being bronze, manufactured by Hardman & Powell. The aim of the design was breadth of treatment without extreme severity. The interior was designed to obtain as much light and natural ventilation as possible.

The ground floor and basement are occupied by the Bank, and the upper floors as mercantile offices, part being reserved for the use of the resident bank officer and the bank caretaker.

The basement is built with blue Staffordshire bricks in cement, and contains the various strong rooms, clerks' dressing-rooms and lavatories, the whole, with the exception of the strong rooms, being faced with white glazed bricks.

The strong rooms are steel lined; the linings with the doors (of extra strong quality) have been supplied and fixed by Messrs. Chubb.

The ground floor consists of banking hall, 60 ft. by 50 ft., and other offices, the walls of which are lined with egg-shell glazed tiles of a light green tint, with Numidian marble dado. The domed lantern lighting the centre of the hall, constructed by the British Challenge Glazing Co., is filled with stained glass, on the centre panels of which are represented the Bank arms.

The cast-iron columns in the hall, supporting the superstructure, 23 ft. extreme height, were cast vertically and afterwards turned bright to the entasis required, the malleable iron Corinthian caps and bases being fixed on afterwards.

The partitions, counter, and joiners' work generally to the banking hall is in mahogany, the counter grilles in wrought-iron and copper. The paving to the vestibule and public space is Roman mosaic, the rest of the flooring being in teak. The manager and directors' rooms have parquet borders, and the walls of these latter rooms are panelled in mahogany.

An old stone chimneypiece, with dark oak overmantel with date 1633, removed from one of the old buildings formerly occupying the site, cleansed from generations of paint, occupies the place of honour in the directors' room, the chimney opening of which is lined with dull glazed and lustre tiles with hearth to match, designed to harmonise with the old work.

The upper floors are approached from a separate entrance at the north end of the building, the staircase being in Craigleith stone with marble strings, balusters, capping, &c., to the first floor.

The walls of the vestibule and lobby, staircase, and corridor are tile-faced. The paving to the landing and corridor is of terrazzo mosaic. The joiners' work to the upper floors is in teak throughout, the windows having reversible sashes (Millar's patent).

A hydraulic passenger lift runs from the basement to the third floor, protected with wrought-iron ornamental casing. The basement under the portion of the site occupied by the entrance hall to offices is provided with strong-rooms for tenants' use. The kitchen and domestic offices for residents and the officers' apartments are on the fourth floor.

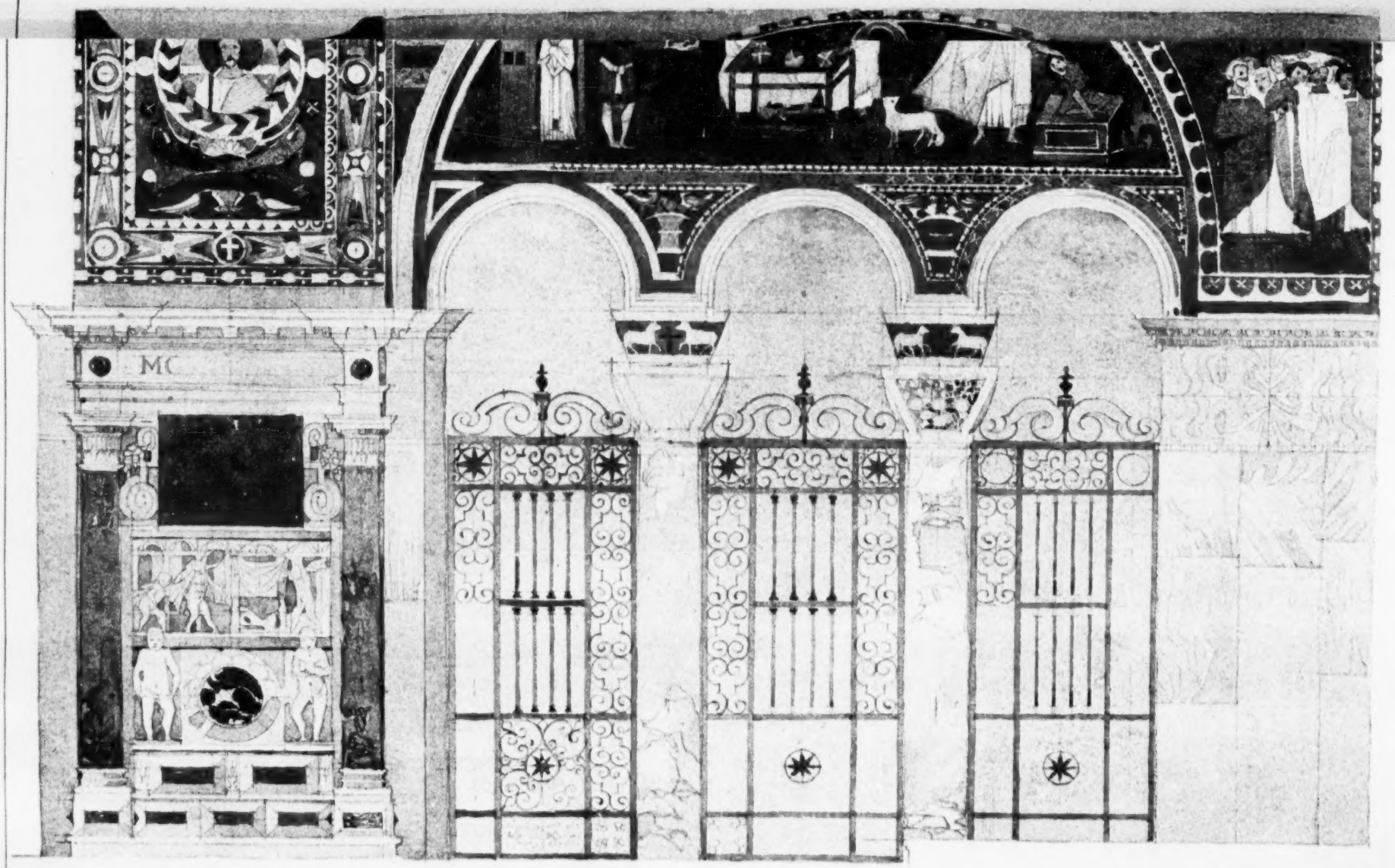
The tiling throughout has been executed by Messrs. Maw & Co.; the mosaic work by Messrs. De Gerlle, Houdret, & Co.; the ornamental wrought-iron counter grilles, &c., by Messrs. W. T. Allen & Co.; and the constructional iron-work by Messrs. J. Westwood & Co. The floors are fireproof, on Picking's twin-arch principle.

The banking premises, and corridors, &c., on the upper floors are lighted with electricity, the installation of which was carried out by Messrs. Rashleigh, Phipps, & Co.

The centre group, representing the bank arms, and the bronze spandrels at the entrance, were

S·VITALE: RAVENNA Section through Choir

SCALE 0 1 2 3 4 5 10 15 Feet

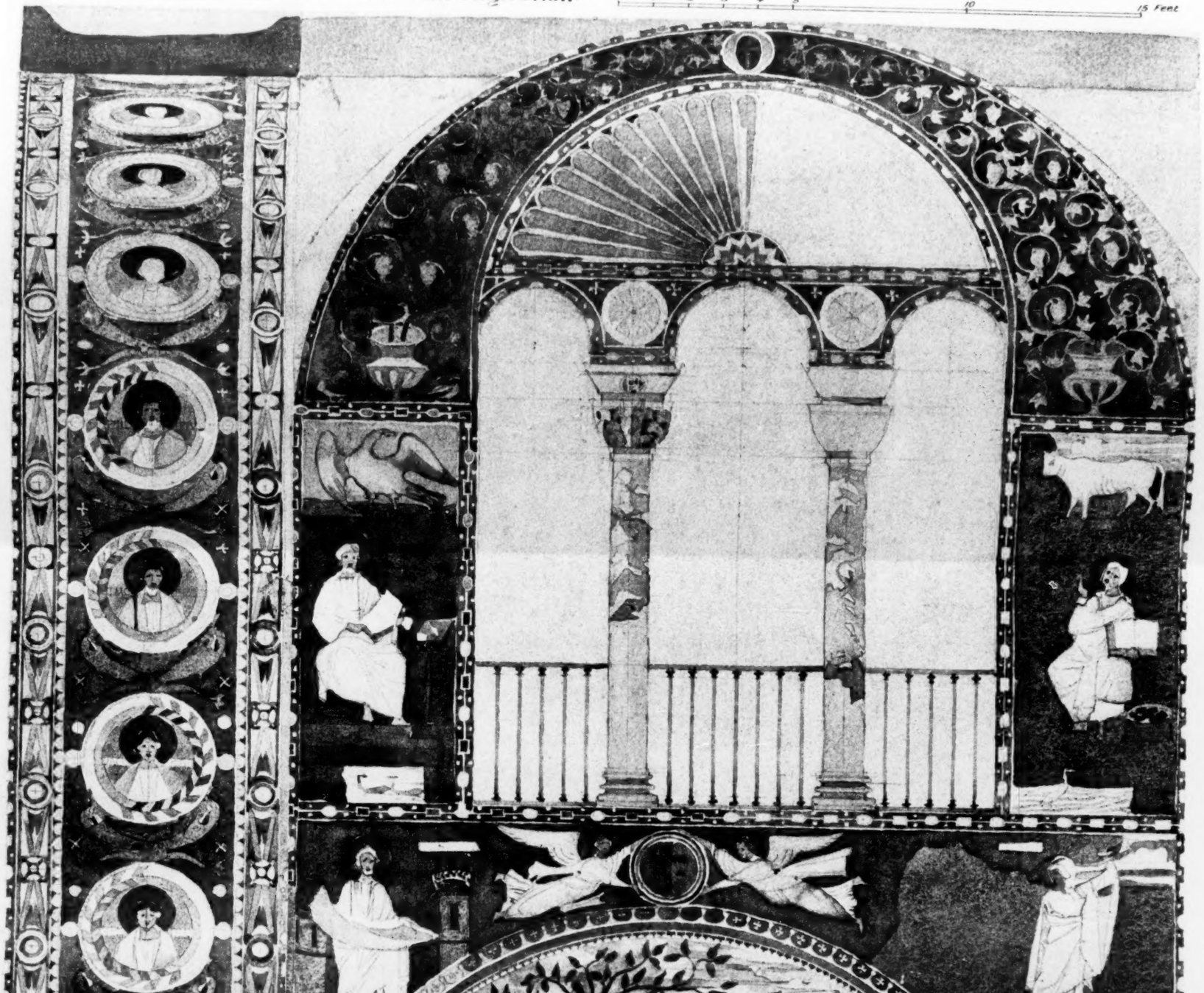


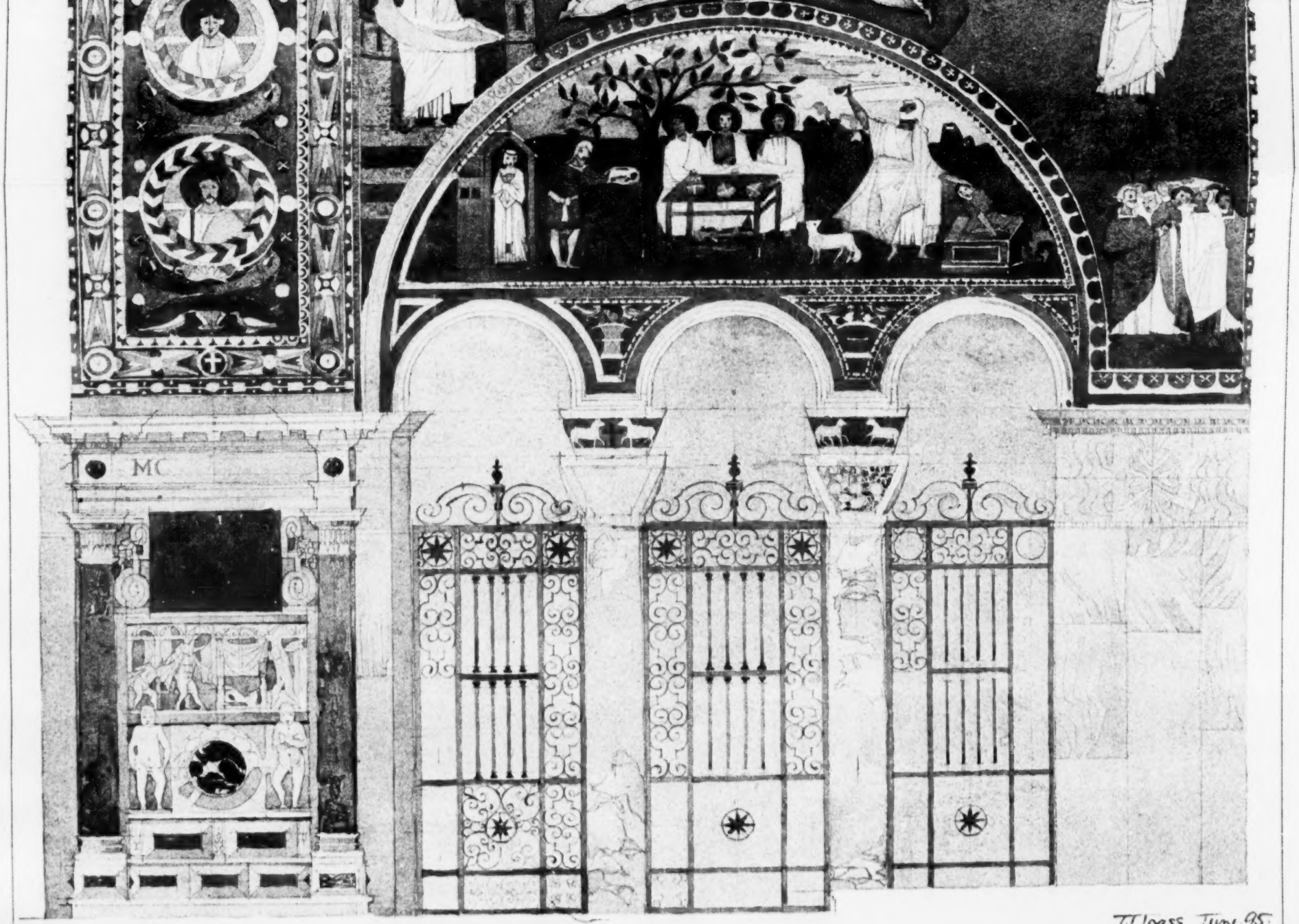
J.J. Joass June 95.

INK-PHOTO. SPRAGUE & Co. 5 & 6 S. EAST HARDING STREET FETTER LANE, E.C.

S. VITALE: RAVENNA Section through Choir

SCALE 0 1 2 3 4 5 10 15 Feet



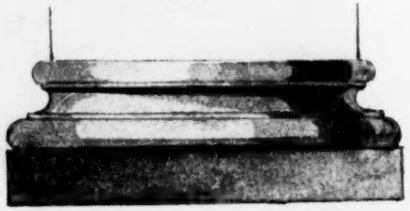


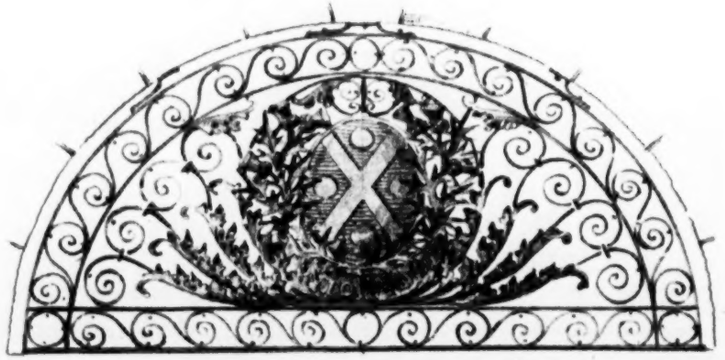
J.J. Joass June 95.

INK PHOTO. SPRAGUE & Co. 4 & 5 EAST HARDING STREET FETTER LANE, E.C.

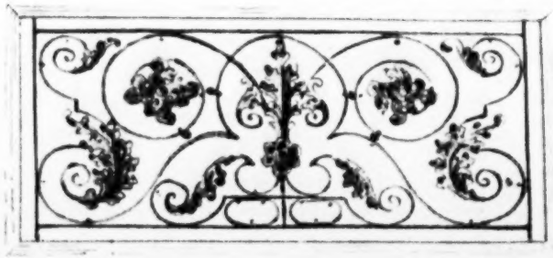
BANK OF SCOTLAND, BISHOPSGATE STREET, E.C.—Mr W. W. Gwyther, F.R.I.B.A., Architect.

IRON
CAPITAL
&
BASE





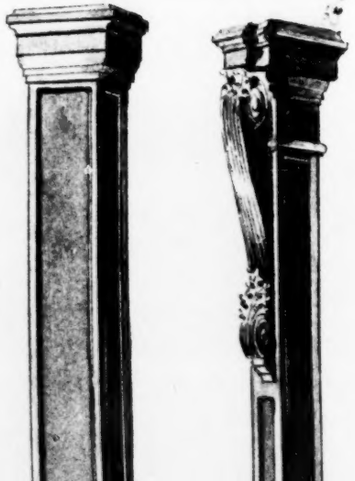
WRO'T IRON GRILLE



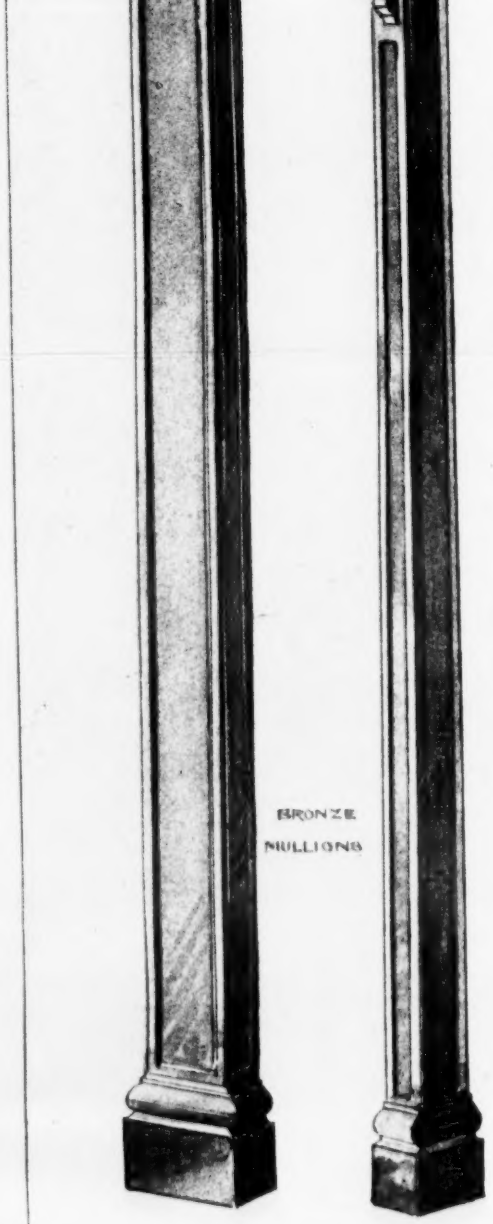
BRONZE GRILLE

BRONZE WINDOW GUARD

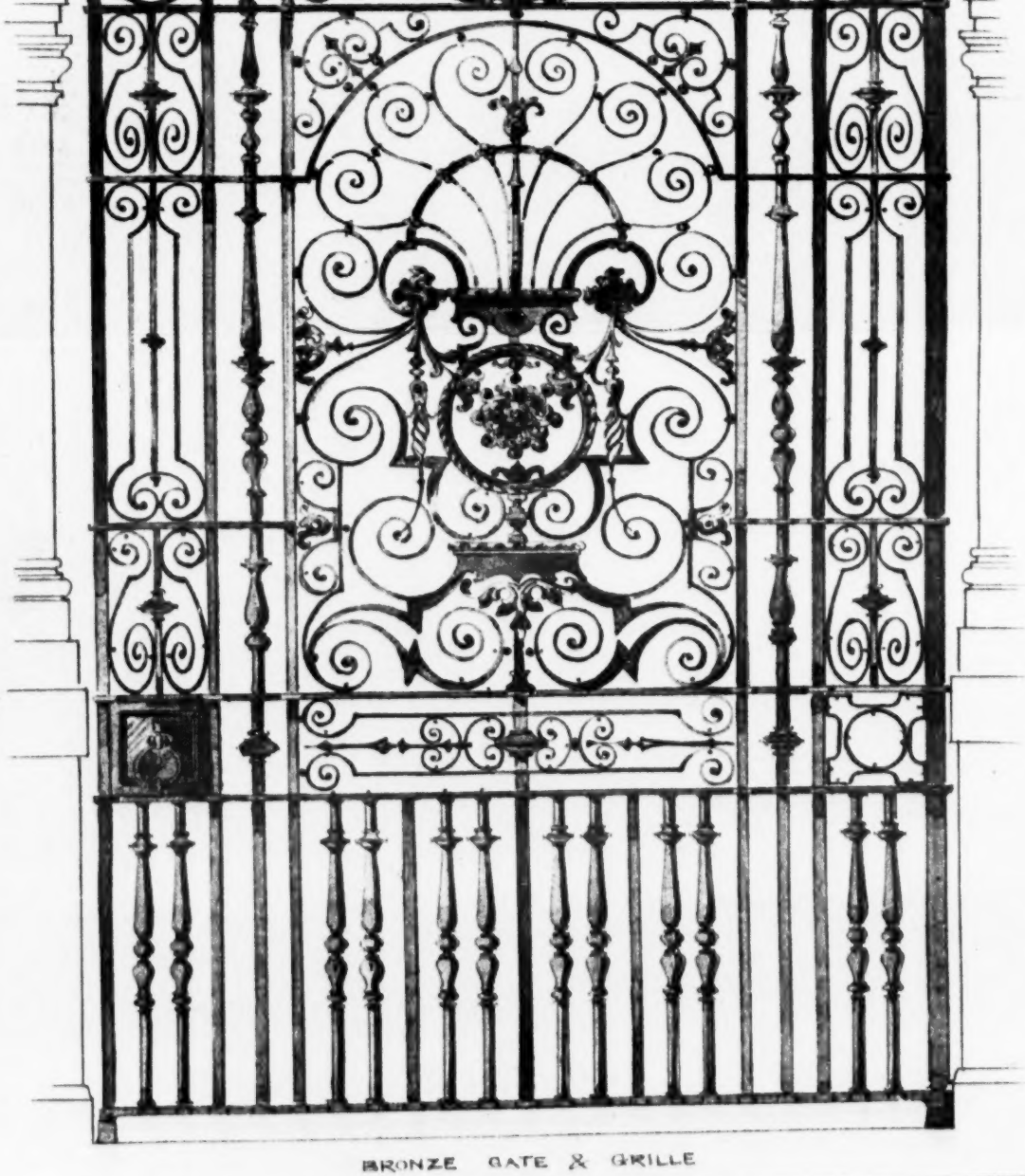
WRO'T IRON DOOR GRILLE



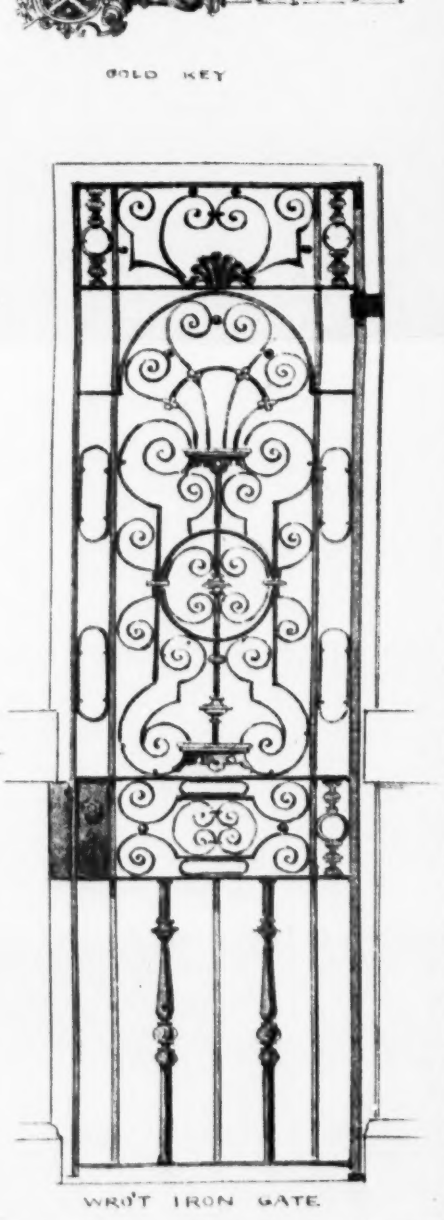
GOLD KEY



BRONZE MULLIONS



BRONZE GATE & GRILLE



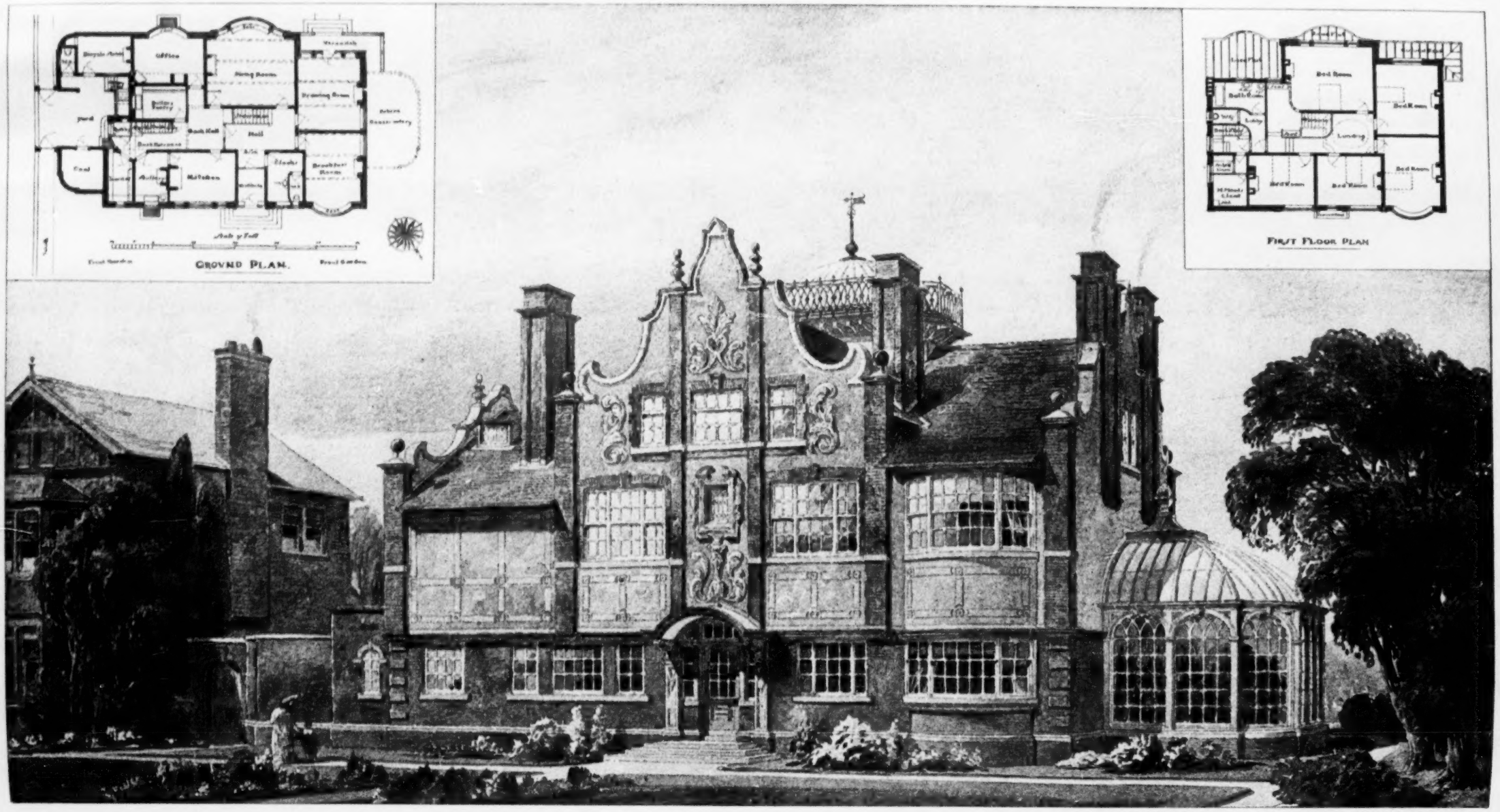
GOLD KEY

WRO'T IRON GATE

PHOTO-LITH. SPRAGUE & CO. 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.

BANK OF SCOTLAND, BISHOPSGATE. DETAILS OF METAL WORK.

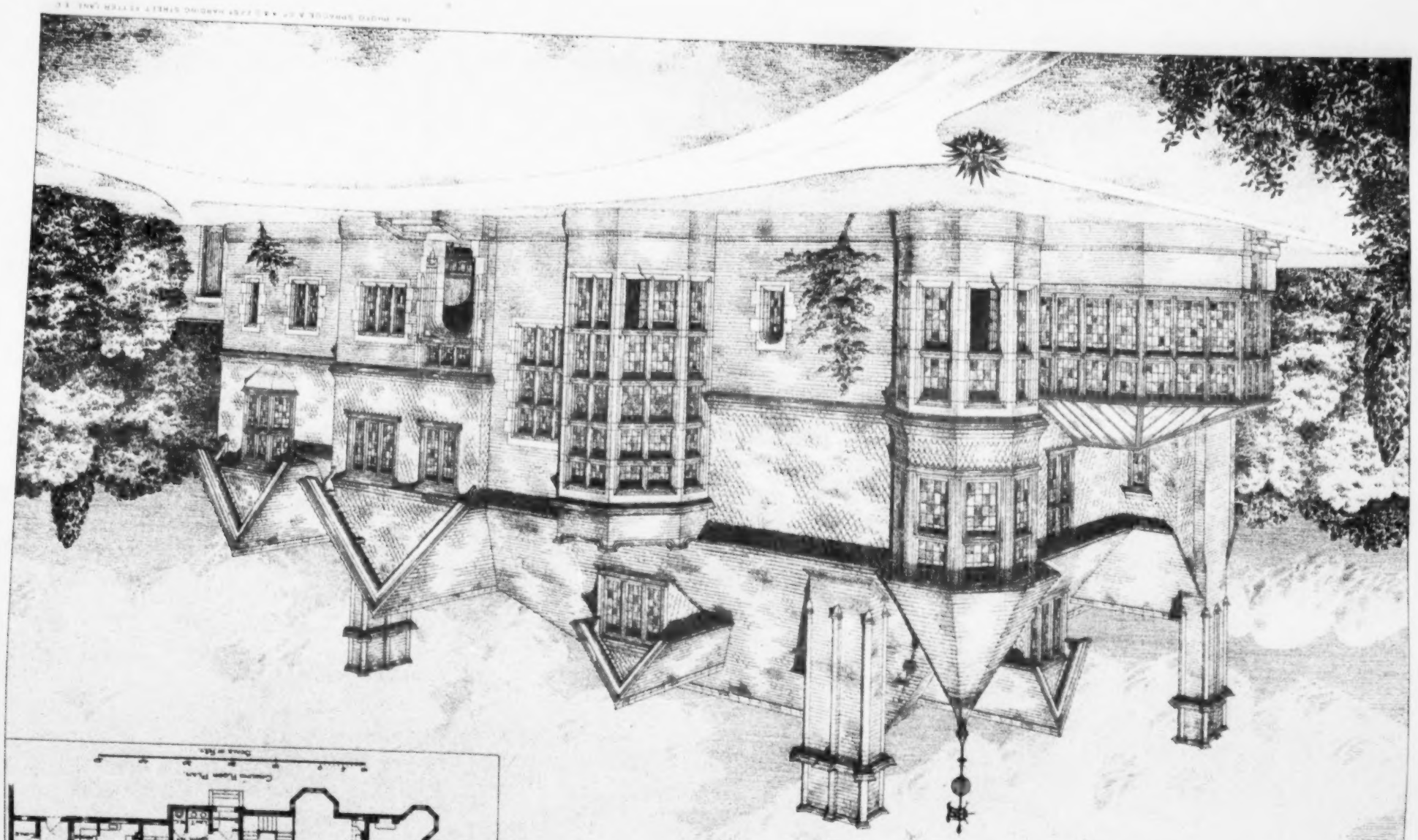
EXECUTED BY MESSRS. HARDMAN, POWELL & CO., UNDER THE DIRECTION OF THE ARCHITECT, MR. W. W. GWYTHER, F.R.I.B.A.

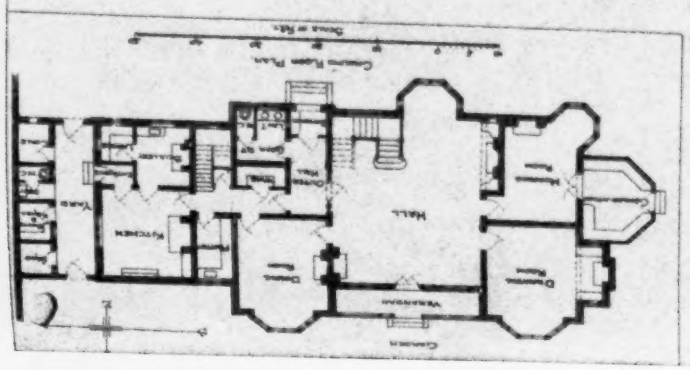


INK PHOTO SPRAGUE & CO. 9 & 5 EAST HARDING STREET, FETTER LANE, E.C.

HOUSE AT RUGBY.—Mr. Larner Sugden, F.R.I.B.A., Architect

HOUSE AT EASTBOURNE





HOUSE AT EASTBOURNE.

LOUIS AMBLER, ARCHITECT.

designed and modelled by Mr. E. Roscoe Mullins, the spandrels being cast by Mr. Moore, of Thames Ditton.

The banking hall is heated by hot-water on the low-pressure system by Messrs. Strode & Co.

The gas work is by Messrs. Biggs & Pharo.

The clerk of works was Mr. R. Wheeler.

The contractors were Messrs. Colls & Sons; and the architect Mr. W. W. Gwyther.

METAL WORK, BANK OF SCOTLAND.

THE whole of the external metal work on this building has been carried out in real bronze, as also have the door fittings in the bank proper and throughout the whole of the offices. The large gate in the centre of this illustration is constructed entirely of bronze, having a small wicket gate arranged in the centre for use after banking hours—the whole forming the main entrance gate to the banking hall and bank premises proper.

The grille over this entrance-gate is also of bronze, and contains the Royal Arms of Scotland, with flags and supporters, &c., all modelled in high relief, and the same on back and front. The grille at the top of the group is in wrought-iron, with the arms and supporters of the Bank of Scotland in the centre. The Corinthian capitals and bases shown in the illustration are a somewhat new departure in this class of work, being composed entirely of iron, in order to harmonise with the iron columns in the banking hall, to which they are attached.

The whole of this work has been carried out by Messrs. Hardman, Powell, & Co., of London and Birmingham, under the direction of Mr. W. W. Gwyther, the architect to the Bank.

HOUSE AT RUGBY.

THIS house is now being erected on the Hillmorton-road for Mr. T. Hunter, chiefly by his own workmen. Red sand stocks are used for the external exposed brickwork, pointed white. The rough casting is finished in Nottingham yellow gravel and broken glass; the decorative modelling being executed by Mr. Stephen Webb. From the Belvedere lighting the principal staircase a fine view across the Warwickshire plain is obtained. The architect is Mr. James Sugden, of Leek and Hanley, to whose detailed drawings the whole is being executed. Mr. J. S. Satchell has acted as clerk of the works.

HOUSE AT EASTBOURNE.

THIS house was designed by the architect, Mr. Louis Ambler, for a site in Granville-road, but has not yet been carried out.

The principal idea which governed the plan was to have a large central hall, to be used as a general living room, with smaller rooms for special purposes leading out of it.

The hall extends in height through two floors, with oak panelled walls and an oak staircase, and gallery running round three sides, giving access to some of the bedrooms. An ingle-nook fireplace, and large mullioned bay window, carried up almost the whole height, form other features of the hall, the window being also a prominent external feature of the entrance front.

The plan shows the arrangement of the ground floor. The first floor contains five bedrooms, dressing-room, bath-room, and other conveniences, and there are three bedrooms, &c., on the top floor.

The outside walls are to be faced with red brick, with Bath stone dressings, the upper parts with ornamental tile hanging, and the roofs covered with Broseley tiles.

COMPETITIONS

SCHOOLS, DOUGLAS.—At a meeting of the Douglas School Board on the 15th inst., it was decided to adopt the plans of Mr. J. Bottomley, Leeds, for new elementary schools to accommodate 800 children. Mr. John Brainsby warmly protested against the adoption of the plans, as being unfair to other competing architects. A condition of the competition was, he said, that the cost should not exceed 8*l.* per head of accommodation. He maintained that the cost of executing Mr. Bottomley's plans would exceed this amount.

PAVILION, WESTON-SUPER-MARE.—At a special meeting of the Weston-super-Mare Urban Council, a report of the Improvement Committee was read, which recommended that an assessor be nominated by the President of the Royal Institute of British Architects to act in connexion with a competition for designs for the proposed new pavilion, the three best designs to become the property of the Council, who shall be at liberty to carry out whichever may appear to them to be the best, the architect whose plans are adopted to be architect of the work. It was subsequently proposed by Mr. Harvey, and seconded by Mr. T. W. Bryant, that the cost of the proposed pavilion should not exceed 8,000*l.*

ENGINEERING SOCIETIES.

THE INSTITUTION OF JUNIOR ENGINEERS.—The annual general meeting of this Institution was held at the Westminster Palace Hotel on the 16th inst., the retiring Chairman, Mr. H. J. Young, presiding. There was a large attendance of members. The Council's annual report, which was read by the Secretary, Mr. Walter T. Dunn, showed that the total membership was now 454, an increase of 36 on the past year. Mr. A. R. Binnie, M.Inst.C.E., is the President for the ensuing sixteenth session. Seven meetings have been held for the reading and discussion of papers, and eleven visits to works have been made, at which the average attendance has been nearly 90. The summer meeting in Scotland was highly successful. The report also contained a copy of the address of congratulation presented to Lord Kelvin, one of the Institution's Vice-Presidents, on his professorial jubilee. Appreciative reference was made to the work carried on by Mr. H. Kempster, as Hon. Librarian; and to the special course of lectures on Marine Engine Design, by Mr. H. M. Rounthwaite. A vote of thanks was passed to the retiring officers for their past services. The scrutineers reported the election to have resulted as follows:—Chairman, Mr. H. B. Varley; Vice-Chairman, Mr. Basil Joy; Hon. Librarian, Mr. H. Kempster; Hon. Auditors, Messrs. W. H. De Ritter and P. Marshall; Members of Council, Messrs. Adam Hunter, E. Berry, K. Gray, Bertram Joy, A. Anstruther Thomson, G. F. Burtt, E. King, and Walter J. Hunter.

ARCHITECTURAL SOCIETIES.

NORTHERN ARCHITECTURAL ASSOCIATION.—The members of the Northern Architectural Association visited, on the 17th inst., Benwell Towers, the residence of the Bishop of Newcastle (Dr. Edgar Jacob). The private chapel of his lordship was also visited. This is the last of this year's summer excursion meetings of the Association.

THE ARCHITECTURAL ASSOCIATION DISCUSSION SECTION. — A most successful first meeting of the Discussion Section of the Architectural Association for the present session took place at 56, Great Marlborough-street, on Wednesday, Mr. W. Pywell being in the chair. Mr. H. C. Lander read a very interesting paper on "Architecture and National Life," in which he considered the nation as an organism, and endeavoured to show that the preponderating characteristics of the nation are inevitably disclosed in its art. He then applied this theory to our own national life, and, sketching the rise of modern commercialism, attributed the present condition of British architecture to its baneful effects. He suggested that it could only be by the nation losing its shopkeeping ideas and ensuring liberty and a decent living to all its sons that we could ever hope to see any improvement; and that if this could be done, such a glorious growth of art would result as has hitherto never been imagined. The discussion which followed was a very animated one, several of the speakers strongly opposing Mr. Lander's somewhat Ruskinian and socialistic position, and others, and especially Mr. J. M. Brydon, the Special Visitor for the evening, while welcoming his idealism, pointed out that in the past great art had always been the outcome of the personality of a few great individuals, such as Pericles, Hadrian, Leo X., the Medici, and the great Elizabethans, rather than of the general mass of the nation; that such was likely to be the case in the future, and that meanwhile it was incumbent on each of us to do his best to raise the ideal and pitch of excellence of that art of which we have the honour to be the servants.—The next meeting will be held on November 4, when Mr. T. Locke Worthington will read a paper on "The Development of Building Estates."

THE FINE ART SOCIETY.—To-day (Saturday) the private view will be held of the first of the Fine Art Society's Exhibitions for the coming winter season, which will consist of a complete historical representation of English humorous art from Hogarth to the present day.

NATIONAL ASSOCIATION OF MASTER HOUSE-PAINTERS.

THE third annual convention of the National Association of Master House-painters of England and Wales opened on the 13th inst. in Birmingham, and was attended by over a hundred members from all parts of the country. Among the provincial centres represented were Manchester, Liverpool, Nottingham, Newcastle-on-Tyne, Edinburgh, Aberdeen, Burnley, Blackburn, Blackpool, Bradford, Halifax, Bolton, Hereford, Hull, Leicester, Middlesborough, Sheffield, Scarborough, Nelson, Colne, &c. In connexion with the convention an exhibition of manufactures interesting to the trade, and of the handiwork of apprentices, was arranged, two apartments at the Municipal Technical School having been lent by the city authorities for the occasion.

At the inauguration of the exhibition the Lord Mayor (Councillor J. Smith) was present. Prior to this there had been a reception by the President and Committee at the Technical School, followed by a visit of inspection to the Town Hall.

The Lord Mayor said that the improvement of the decoration of our houses opened a very wide field, and perhaps nothing had advanced more markedly in the last twenty years than the design of wall-papers. To have the rooms we occupied all our lives decorated artistically was not a small matter, and he sometimes wondered how our forefathers managed to exist in some of the rooms they used to occupy. He thought the public wanted guiding in this matter, because at the present time the redecorating of our houses was not altogether an unmixed pleasure. The apprenticeship system, which was part of the policy of the Association to foster, was in every way commendable. Another advantage of the Association was that in any difficulty or dispute it might be instrumental in preventing strikes. He thought perhaps the finest example of recent internal decoration which was to be found in the Midlands was at Hewell Grange, but he was sorry to say Lord Windsor had to employ Italian artists to do the work.

A vote of thanks was accorded to the Lord Mayor for his presence and address, on the motion of the President, seconded by Mr. Alexander White (Liverpool). Mr. E. Breakspear (Birmingham) moved a vote of thanks to the Technical Instruction Committee for the use of the rooms for the purposes of the exhibition, and this was seconded by Mr. Cunliffe (Blackburn), and heartily adopted. Councillor Martineau acknowledged the vote, observing that the Technical School Committee felt the object of the Master Painters' Association was precisely that which they themselves were aiming at. It was to improve the quality of the work of the artisan, to infuse into that work the intelligence which should make his daily labour something of a pleasure to him as well as the means of gaining his livelihood. In the system of apprenticeship they believed that idea would be carried out. The proceedings then terminated.

The members reassembled in the afternoon at the School of Art, Margaret-street. Mr. Taylor delivered an interesting presidential address, which was mainly devoted to the subject of education in colour. He advised young men to study Nature in all her moods. It might be urged that, as they had to adopt a conventional treatment, it was unpractical to look at the matter thus; but he denied that. Whatever tended to raise a man's taste, whatever made him dissatisfied with coarse, vulgar, inharmonious blendings of colour, had a most distinct bearing upon his work, conventional though it be. Each season had its suggestions to offer, and their work, though more conventional than that of the artist, would ever gain by a loving Nature study. He would go further, and plead that if a love and a high ideal were not imparted to the craftsman's work common honesty should at least be observed.

The Secretary (Mr. W. G. Sutherland, Manchester) presented the annual report, which stated that the year had been one of progress. Local associations at Llandudno, Huddersfield, Darwen, Bury, North Staffordshire, and Wolverhampton, had been affiliated, and the private membership had been recruited in many other towns. The Hon. Treasurer (Mr. Thomas Preston, Burnley) also presented a satisfactory report, announcing a balance in hand of 20*l.* 19*s.* 1*d.* The reports were duly adopted, and a vote of thanks was accorded to Messrs. Sutherland and Preston for their services.

In the evening the members met at the Technical School, under Mr. Taylor's presidency. Mr. J. F. Allon read a paper on the "Federation of Local Associations in Counties and Districts," and afterwards Mr. E. R. Taylor, head master of Birmingham Municipal School of Art, contributed a paper under the title of "A few words on the Art and Craft of the House-painter." He contended that if the profession was to be maintained, masters and workmen must become teachers and artists. In Birmingham the apprenticeship system was practically dead, but without that or something analogous to it they could not hand down the art and craft of the painter. Teaching had ceased, and the craft was suffering in consequence. Art was as necessary for the simplest and least expensive furnishing of a room as for the grandest architecture, painting, or sculpture. Technique varied in quantity and direction, but the art was one, and was expressive of a feeling for the right relation of visible

things in line, mass, and colour, and was based on Nature's harmonies. The endeavour to inspire their workmen with that art-feeling, and to guide them in its expression, appeared to him the main object of their organisation. If the workmen could gain a little art training which included individual observation and expression, then their commonest work would no longer be a monotonous slavery, but a handicraft, and all they did would be permeated with art-feeling. A new interest would be awakened which would be good for master and for man, and as that power spread new fields would be opened for its exercise. Why should not the new "poster" (especially those which had to be exhibited for a long time) be done by the house-painter as well as by the printer? Papers cognate with the same subject were also read by Mr. J. C. M. Vaughan and Colonel Robert J. Bennett, the former dealing with "The Early Training of a Painter," and the latter with "The Struggle of Craftsmen, Past and Present, to Maintain the Principles of their Trade."

The second day's proceedings opened with a breakfast at the Grand Hotel. The President (Mr. John Taylor) entertained about 250 guests.

In the afternoon the members assembled at the Municipal Technical School, where several papers on topics interesting to the trade were read. The chair was occupied by the President. Mr. M. Lewes Crosskey, Director of the Industrial Art Department, Glasgow, and the West of Scotland Technical College, read a paper on "The Function of the Technical Class in the Training of Our Boys." He thought it would be fatal to the artistic interests of the country if schools of art were to give their attention to requirements of a purely commercial character. These should be left to trade schools, where the mechanical methods of reproduction formed an essential feature in the instruction given, and were not placed in a subordinate position.

Mr. Windle (vice-president) moved a resolution expressing the thanks of the Association to the reader of the paper, and commending the principles of instruction laid down by him. Mr. Windle said he was convinced from his own experience that masters would never be able to get lads to go to the shop to do the kind of work which they would do at the technical school. At the same time he was of opinion that some of the drudgery which a boy was bound to go through in the workshop might be omitted from the training given in the technical school. The resolution was seconded by Mr. E. Breakspear. Messrs. W. H. Cunliffe (Blackburn), Howard Graves (Nelson), G. H. Morton (Liverpool), Room (Bradford), A. Hartley, jun. (Burnley), W. G. Sutherland (Manchester), R. Borrows (Manchester), and Colonel R. J. Bennett (Glasgow), took part in a discussion which followed, particular stress being laid on the importance of the apprenticeship system. The resolution was heartily carried, and Mr. Crosskey briefly replied.

Mr. E. Breakspear then delivered an address on "The Delights and Uses of Colour." Having premised that colour produced in the mind of man sensations of pleasure and of pain, of exhilaration and excitement, or of soothing and rest, the speaker went on to deal with the subject in its æsthetic rather than its scientific aspect, pointing out the intimate relation between taste in colour and the particular stage of civilisation of a people. Incidentally Mr. Breakspear paid a tribute to the late William Morris, remarking that, however they might have disagreed with the way in which he conducted his business, which had been anything but encouraging to the master painter, he had undoubtedly done good service in refining and educating the public taste, especially in the matter of wall-papers. Although, like most reformers, he allowed his hobby to carry him to extremes, they must give him his meed of praise. Let no one think the business of a house-painter was to be looked upon from a mere commercial point of view. Every true decorator would love to develop the beauty of his craft in the adornment of public and private buildings, and the meanest cottage would be deemed not unworthy of his attention. It was the province of their Association to help to educate and refine public taste; and if it were true that by much sunshine longevity was promoted, might it not be equally true that health and long life were brought about by the environment of beautiful colouring? Let no master painter take a sordid view of his position. They existed to perform a useful and important part among their fellow men.

A vote of thanks was accorded to Mr. Breakspear, on the motion of Mr. Thomas Preston (Burnley), seconded by Colonel Bennett.

Mr. Walter Ratcliffe (analyst to the Association) read a paper entitled "Some Considerations on Oils and Pigments." Mr. Ratcliffe was thanked for his paper, on the motion of Mr. Cole, seconded by Mr. Horsfield (Manchester).

Another meeting took place in the evening at the School of Art, the proceedings opening with a paper by Mr. Thos. Bonnar on "Ancient Mural Decorative Art," illustrated by a fine series of lime-light views and coloured drawings. The writer mourned the fact that owing to the rough treatment of our ancestors there was scarcely a vestige left in Scotland of the pre-Reformation ecclesiastical mural decoration. He described colour decorations on the groined roof of Glasgow Cathedral, and others at Dryburgh Abbey, the former dating from the twelfth century, and said a comparison with contemporary work in England—where circumstances had been much more favourable for the preservation of these sacred buildings—afforded inferential proof of there being an analogous resemblance in the decorative treatment of the interiors of ecclesiastical buildings in the two countries. In the fourteenth century there must have been liberal employment for the decorative craft in England, which would compare favourably with the boasted advance of artistic tendencies of to-day. During the fifteenth and sixteenth centuries the largest number of mural paintings was executed, and most of the existing examples dated from that period; but it was much to be regretted that, owing to less careful preparations of the surfaces, these were not in such good preservation as the remaining works of the earlier days. With regard to secular decorations, Mr. Bonnar thought the earliest examples must have exhibited in form and colour more refined qualities, there being evidences of decadence in the later specimens, as if the artist had been working from a higher example.

Mr. John Ratcliffe read a paper entitled, "Some of the Benefits of Union," urging the importance of the organisation proceeding on lines of good fellowship, and an enlightened determination to advance the mutual interests of those engaged in the trade. On the motion of Mr. Sutherland, seconded by Mr. Preston, a vote of thanks was passed to the Management Committee of the School of Art for the use of the meeting-place; and advantage was also taken to acknowledge the personal interest taken by Mr. E. R. Taylor (the head master) and Mr. Preston Hytch (secretary) in promoting the comfort of the visitors and advancing the aims of the Association. A draft code of rules was submitted in connexion with a scheme for founding an Institute of British house-painters, but it was felt that it would be inexpedient to enter on the consideration of so large a question without further time for deliberation, and the question was deferred. Councillor Smith, of Sheffield, was chosen as the President of the Association for the ensuing year, and it was resolved to hold the annual convention at Sheffield. Mr. J. C. M. Vaughan (Hereford) was elected Vice-President; Mr. Preston (Burnley) was re-elected Hon. Treasurer; and Mr. Sutherland (Manchester) Hon. Secretary. The Committee was afterwards appointed, and the proceedings closed with votes of thanks to the retiring officers.

We are indebted for the above account to the *Birmingham Daily Post*.

Correspondence.

To the Editor of THE BUILDER.

"DESIGNER AND CRAFTSMAN."

SIR,—There is no "condemnation."* I had no intention of beating on the breasts of others; never, indeed, thought of persons or groups, but only of the great stream of tendency and the "swim" of things.

So far as the design is a diagram or memorandum fixing the thought of one well conversant with work and materials, it may evidently be a helpful means to an end. Of knowledge of work and materials there are, of course, degrees; but the only vital fresh knowledge comes of actual handling, as by a Greek sculptor, a mediæval mason, or a modern painter. Failing this living first-hand knowledge of work, fall back on such simple things as can best be carried out by the mechanical means available, leaving ornamental work to independent artists.

In speaking of a large subject, I have never felt it necessary to chain my *thought* within the limits of my practice. I feel a certain absurdity in explaining what I *do*, but I can hardly avoid a direct question from the *Builder*, and in answer to it say that I "design" with drawings from sketches to full sizes. It is for this reason that there is no attempt in the things referred to beyond that "extreme simplicity" and "mere putting together of material" which you notice on your front page. "How did the man who made the table come by the form?" The corners of the slab were broken. It was the "inspiration" of the slab, not an abstract design.

W. R. LETHABY.

ARTS AND CRAFTS AT THE R.A.

SIR,—Referring to your plea for a better representation of architecture at the Royal Academy, may I suggest that what the late William Morris used to call "everyday art" ought also to be represented there?

Nothing, it appears to me, would tend more to the advancement of the useful arts than that weavers, goldsmiths, &c., &c., should have the opportunity of exhibiting their goods, in cases provided for the purpose, at the Royal Academy.

C. F. M.

* See Note on pages 305-6 of our last issue.—ED.

*** We have made that suggestion more than once, and we believe the former distinguished President of the Royal Academy, Lord Leighton, was strongly in favour of admitting into the Academy Exhibition the class of work represented at the Arts and Crafts Exhibition, but he had little support from his colleagues. The majority of the Royal Academicians are painters, and, with one or two exceptions, apparently care little for any form of art except painting.—ED.

ARTS AND CRAFTS EXHIBITION.

SIR,—At the risk of ostracism from the society of the latter-day artist I cannot withhold my admiration of Mr. Eden's courage in stating his honest opinion of the hysterical school, which endeavours to shove its tenets down the throat of an unfortunate public seeking for novelty. Novelty has a great deal to answer for. The humbug of art, with its floppy clothes and flappy ties was scotched, not killed, by the genial Du Maurier—it still lingers on among the elect.

If we are to accept Mr. Wilson's teaching we must eventually return to the Cyclopean age, whence we emerged some considerable number of centuries ago. Such architecture, to my dull mind, seems as unreal as one of Martin's pictures—an intellectual nightmare, full of eccentricities. It apparently came, like a good many other questionable advantages, from America, and it is time it returned to the land of its birth. Art, we may take it, should be the outcome of the requirements of the age, and in use should not be compelled to adapt itself to what it has practically never called into existence. This comfortless furniture I see illustrated no doubt finds a mart somewhere—indeed it seems to have invaded Germany, which is carrying the war into the enemy's country with a vengeance. Probably it has its home where carpetless rooms and shadowless design still reign supreme. But picture to yourself a portly Hausfrau seated in one of those little "what d'ye call 'ems" at the sides of exhibit 294.* Consider the feelings of a lady, with any regard for her gown, on being offered the rush bottomed "luxury" of exhibit 296. Imagine the face of an elderly gentleman on being introduced by his host to the lath-backed "ease" of No. 307! For heaven's sake let us at least have a little comfort in our art! These hard edges and straight backs—like a mixture of tee-squares and drawing-boards—make one shudder. Thank goodness one never meets with them in the club smoking-room or the library of a country house. To the tired worker of brain or body they would be anathema indeed. By all means let those good people use them whose angularities they appeal to, but give us ordinary mortals something a little less hard, something with a certain amount of humanity in it.

To our English common-sense I look for salvation. The "phase" must work itself out—I hope before the century—with the Beardsley drawing and the Ibsen play. Flimsy ironwork, unsuited to its purpose, angular furniture and archaic architecture, let them go the way of incongruous mouldings and hidden construction. They won't be missed.

If *they* be art, then I frankly array myself on the side of Philistia. What we want is honest progress, not retrogression, in art. If we would go forward, let us find out what the public really require and give it them in a wholesome artistic guise; but let our art be art with usefulness—art without affectation.

PERCY G. STONE.

SIR,—As I believe that I am the only surviving Troglodyte in England, may I be permitted to correct a few historical inaccuracies in Mr. F. C. Eden's letter published in your issue of the 17th inst.? The architecture of the Troglodyte age, I can assure you, was adorned not with "rats and mice and creeping things," but with cusps and crockets, alphas and omegas, angels and evangelists, and deftly unintelligible texts. What a comfort it must be to your readers, however, to see that in this glorious nineteenth century our architects, even if they are unable to produce "monumental" choir stalls, can still write monumental epitaphs upon their brother artists!

October 19. CHARLES A. NICHOLSON.

LONDON SCHOOL BOARD AND CONTRACTORS.

SIR,—We were glad to see your Note in last week's *Builder* respecting the School Board method of dealing with contractors, as we were treated in an exactly similar fashion—after having kept a foreman idle for several weeks in daily anticipation of receiving the order to commence. The Board—like the Office of Works, Admiralty, and other Government bodies—pose as model employers, but their way of doing business with any one above the rank of a working man is hardly to be commended as a model of fairness or justice. We should also like to ask if there is any good reason why the Office of Works and Admiralty should not conform to the almost universal practice, and make the quantities the basis of the contract. As it is, they appoint their surveyor, and compel the contractor to pay

* Probably Mr. Stone has not seen the original, and is deceived as to the scale of our sketch. The mantelpiece is a very large one, and the seats are large and strong enough for any practical use.—ED.

him in full, and then work the oracle somewhat in this manner:—Supposing in a job there are required twelve bib-taps and eight stop-taps, but the surveyor, by some error, has taken eight bib-taps and twelve stop-taps, then the Office of Works will deduct the four stop-taps on the ground that, although taken in the quantities, they are not required, but will refuse to allow or pay for the four additional bib-taps required, on the ground that they are not responsible for the accuracy of the quantities; so the unfortunate contractor has to recover if he can of the equally unfortunate surveyor, whilst the British taxpayer gets his four taps for nothing. Doubtless this is quite legal, but we anticipate that most of your readers will agree that it is legal practice of a somewhat "Shylockian" kind, and, as such, more worthy of a pettifogging obscure local practitioner than of those acting on behalf of the wealthy British nation.

DISGUSTED CONTRACTORS.

GATESHEAD UNION.—COMPETITION FOR PROPOSED COTTAGE HOMES.

SIR,—You so frequently call attention to the unfair conditions of architectural competitions that I should not trouble you with the enclosed copy of the conditions prepared for the above if they did not present features of unusual interest.

The conditions shortly are these. The Guardians require buildings which are to cost 6,500*l*. Architects are asked for plans to the one-eighth scale, to be sent, carriage paid, with printed or type-written copies of an explanatory statement of works and materials.

The Board reserves the right to decide the selection unaided.

The Board does not bind itself to accept any plan.

The approved design shall become the property of the Board, and remain in its hands.

The Board reserves itself absolute freedom as to the appointment of an architect, irrespective of the decision arrived at in the selection of a design.

The remuneration of the architect appointed will be 5 per cent. upon the amount of the tender accepted.

The architect must bear his own travelling and other expenses.

No premiums are offered.

If, under these conditions, any architect is sufficiently foolish or sanguine to send in plans, he might be so unfortunate as to have them accepted by the Board. The plans would then become their property, and the Board could appoint their own architect, and not pay a penny for the preparation or carriage of the plans.

GEO. HURST STANGER.

Wolverhampton, October 19.

WELSH SLATES.

SIR,—The continuance of the strike at the Bangor Penrhyn Quarries has occasioned, we fear, some misunderstanding as to the possibility of supplying the requirements of architects, contractors, and others, an impression appearing to prevail that Welsh slates are almost unobtainable. This is not so, although there is a considerable shortage in supplies. The Dinorwic Bangor quarries are working as usual, and supplying the more pressing demands in the slate market; and we, and doubtless other merchants, have stocks, both landed and afloat. It is, perhaps, not superfluous to add that the Portmadoc Quarries are supporting the trade as freely as supplies permit, and that the diminished output in Wales has had the usual result of increasing the cost of slates.

ROBERTS, ADLARD, & Co.

The Student's Column.

RURAL DRAINAGE.—XVI. AND XVII.

IN their early history sewers were constructed merely for the purpose of removing surface and subsoil water, and their inlets, such as road gullies, were left untrapped. As soon, however, as fœcal and other putrescible matter was conveyed by the sewers, foul gases began to escape through the untrapped gullies, causing a nuisance, and as a result the gullies were trapped. The foul gases were not, however, to be dealt with so easily, and forced their way at the points of least resistance—usually into the houses. It then became evident that means of escape for these gases should be provided and placed in such situations as not to be a nuisance or injurious to health. Ventilating openings were constructed in the centres of the streets, thus allowing the gases to escape at points as far distant as possible from the pavements and houses, and to become rapidly diluted. The rationale of this method was thus stated in his "Suggestions" by Sir Robert Rawlinson.

"It has been suggested that free and open sewer and drain ventilation will so taint the atmosphere within and over a town as to cause houses at a lower level to pollute those situate at higher levels. Any serious injury from this result need not be feared; as, with the abundant means for ventilation suggested, the air within the sewers (by dilution) will be comparatively pure, and further dilution and dispersion will dissipate every trace of taint and danger, the dilution, through dispersion, being as the cube of the space and the velocity of the air for the time being. The air in one mile of street sewer may be taken at 1,000 cubic yards; the air in the streets above at 500,000 cube yards, changed and renewed many times during the day, so that the air in the sewer will be several millions of times less in comparative volume than the air in the street; the dilution of any sewer gas will therefore be in some such proportion" (page 15).

Nevertheless the frequency with which the public was reminded by nose and eye of the existence of these ventilators caused endless complaints, and many suggestions were, and still are, made for the purpose of preventing the formation of sewer gases or of rendering them harmless or unobjectionable.

Amongst these propositions may be mentioned the following:—"The Municipal and Sanitary Engineer's Handbook," H. P. Boulnois, p. 272.

1. Open shafts are carried up from the crown of the sewer to the centre or side of the roadway, and there protected by an iron grid or grating at the level of the street surface.

2. Open shafts are carried up the sides, the gable ends if possible, of buildings in the neighbourhood of the sewer; these shafts may be either open at the top, or be furnished with exhaust cowls.

3. By making use of rain waterpipes from adjoining buildings.

4 By utilising lamp-posts or columns adjacent to the sewer.

5. By passing or filtering the foul air through charcoal placed in trays or other receptacles in shafts.

6. By making use of ordinary chimney-shafts.

7. By lofty shafts erected at convenient positions, which are either in connexion with furnaces, or are simply open to the air.

The first two methods are usually applicable in rural districts and are best worked in conjunction with each other. If the sewers are properly constructed with a self-cleaning flow, open shafts in the centres of the roads should be unobjectionable, whilst they are undoubtedly the most efficient. Where, on account of local, sentimental, or imaginary causes, open shafts in the road are objected to, the second method can be adopted in addition, if possible, instead of in substitution.

The value of short shafts is thus stated by Mr. Baldwin Latham: "The efficiency of a shaft is proportionate to the square of its height; consequently short shafts of larger area may be made quite as effective as smaller shafts of greater altitude. For example, take the case of a simple shaft terminating in the centre of a roadway, the sewer being 9 ft. deep. Now, such a shaft theoretically, if made three times the area of a shaft 81 ft. high, would be quite as efficient; while in practice the low shaft would be more efficient, as there would be less friction." (Sanitary Engineering, p. 356).

The shafts should be fixed as frequently as possible, and not more than 100 yards apart. If a nuisance from the escape of sewer gas is complained of, it is a clear case that the ventilation is insufficient, and the proper remedy is not to trap the offending aperture, but to make more.

The method of using rain-water pipes is most objectionable, and should never be permitted.

The utilisation of lamp-posts is unobjectionable, but practically ineffectual on account of their small diameter.

The use of charcoal filters or traps was at one time very highly commended, but the method has been abandoned, except in a very few cases.

The use of ordinary chimney-shafts for sewer ventilation is dangerous and altogether inadvisable. In view of the recent action at law against the King's Norton Rural District Council, it is unlikely that this method will receive countenance in the future. In this case the executors of the late Mr. T. H. Smith obtained 3,500*l*. damages on the allegation "that he (Mr. T. H. Smith) died from illness caused by the defendants wrongfully breaking, and entering, and putting, and continuing to maintain a ventilating shaft from a sewer into a chimney of 'Daylesford' (the residence of the deceased), or alternatively that the defendants constructed the work in a negligent manner, or allowed the same to get into bad order, whereby sewer gas, in or about January last, escaped into the house, and caused the illness and death."

The use of lofty chimneys unconnected with furnaces has already been alluded to in speaking of short shafts, and the additional effect of furnaces, except in the case of sewers with no side openings or junctions, is inconsiderable. "A sewer may be compared to a tube perforated entirely throughout its length. If the introduction of a special means of ventilation, similar to that adopted in mines (furnaces, fans, &c.), could be brought to bear in a system of sewers, it would have the effect of causing powerful currents of air to pass into the sewer from the nearest openings, to the exclusion of any current at all from the more remote openings in the sewers." "All shafts or chimneys of every description, when used for the ventilation of sewers, must be looked upon as having little or no power in themselves to produce ventilation, but must be considered as a simple extension of the sewer for facilitating the discharge of noxious matter at some convenient place where it will be harmless" ("Sanitary Engineering," pp. 339, 357).

In addition to the above, many mechanical, chemical, and electrical methods have been proposed, including Keeling's destructors, in which coal gas is employed to extract and destroy the sewer gas, the Hermite process, by which the sewage is antiseptically treated in the sewers with electrolysed sea-water, and Shone's nozzles for utilising the waste compressed air from the ejectors.

Whatever method is employed for ventilating the sewers it must comply with the following requirements:—

"1. That the system shall be simple in its operation, and not likely to get out of order, and that it shall be independent of uncertain mechanical aid.

2. That it shall admit of the expulsion of all sewer air, and the supply of fresh air at all periods.

3. That the escaping gases shall be so diluted with atmospheric air as to be rendered harmless, or that they shall be destroyed or arrested.

4. That the system shall not impede natural ventilation.

5. That it shall not be costly in execution or maintenance" ("Sanitary Engineering," p. 348).

Sewer gas is extremely variable in its composition. When derived from sewage that has been allowed to stagnate and decompose, it is found to contain less oxygen and more carbonic acid gas than air, together with a large amount of fœtid organic matter, and variable quantities of marsh gas, sulphuretted hydrogen, and ammonium sulphide.

When sewer gas is derived from well-ventilated sewers it is found to approximate very closely to the air outside.

In a paper read at the meeting of the British Medical Association in 1895 Mr. J. Parry Laws, F.I.C., said: "The injurious effects which have been, and still are, attributed to sewer air may arise from three separate and distinct causes:—

1. From poisonous inorganic gases, such as sulphuretted hydrogen and sulphide of ammonium, and concomitant diminution of percentage of oxygen in the sewer air.

2. From the organised constituents (the micro-organisms) of sewer air.

3. From the presence of some volatile and highly poisonous organic compounds, possibly of an alkaloidal nature.

"The dangers arising from the first of these three causes are, on the whole, not now very great, owing to the improved construction and more complete ventilation of our sewers. We are, nevertheless, occasionally reminded of the dangers arising from this cause by some sudden and tragic loss of life, such as that which has so recently occurred at East Ham." After referring to the numerous experiments made by himself, Carnelly, Haldane, Petrie, and Andrewes, the author continues, "We have shown that the micro-organisms of sewer air bear no relation whatever to those of sewage, and that the predominant micro-organisms of sewage are entirely absent from sewer air. Furthermore, we have shown that it is extremely difficult to find any evidence of the presence of the typhoid-fever bacillus in ordinary sewage, and that instead of sewage being a favourable soil for its indefinite multiplication, as stated by many advocates, it gradually but surely exterminates it. These results lead irresistibly to the conclusion that sewer air has no power of taking up bacteria from the sewage with which it is in contact. If sewer air is free from those special organisms which exist in immense numbers in every drop of sewage, how indefinitely improbable, nay, almost impossible, becomes the existence of pathogenic organisms which can only

be present in sewage, relatively speaking, in most minute proportions."

With regard to the third cause, Dr. Alessi's experiments tend to give it some slight probability, but the evidence as yet is too scanty to justify any absolute conclusions.

Whatever may be the degree of noxiousness possessed by sewer air, the entire burden of protecting the British public from its evil influence is cast by a beneficent Government upon the shoulders of the Local Authority. "Every Local Authority shall cause the sewers belonging to them to be constructed, covered, *ventilated*, and kept so as not to be a *nuisance* or *injurious to health* . . . ." (Pub. Health Act, 1875, sec. 19). It must be admitted that this was rather a bold stroke on the part of the Government!

The principal natural causes which produce or affect ventilation in sewers are:—

1. Wind.
2. Temperature.
3. Barometric Pressure.
4. Flow of Sewage.

The two last causes are practically unimportant, and it would appear, from the experiments made by Mr. W. Santo Crimp at Wimbledon in 1888, that the second cause may also be neglected. Mr. Santo Crimp says: "Temperature must give place to wind as the most powerful agent in causing movements of sewer air, and, as a consequence, downhill movements, in cold weather especially, are no longer inexplicable. Throughout the entire series of experiments the author found, beyond all question, that the wind was the only agent causing movements of sewer air that could be recorded by an anemometer, and that currents were uphill or downhill accordingly as the individual sewer experimented upon was affected by the wind" ("Proceedings of the Association of Municipal and County Engineers," vol. xvi., p. 13).

The diversity of opinion existing amongst engineers and scientists in regard to the ventilation of sewers may be gathered from the following instance:—A committee of the Association of Municipal and County Engineers was appointed to collect information and make a report. When the report was received in 1892 the Council of the Association reported that they were of opinion the views expressed in the suggestions received are so conflicting and necessitate so great an expense in publication that they consider the result of publication would not be commensurate with the cost involved thereby.

Before discussing the methods which are utilised with more or less success for the disposal of sewage, it will be useful to consider what sewage is, and what is meant by its disposal. For this purpose some recapitulation will be necessary.

Sewage includes:—

1. Solid excreta.
2. Liquid ditto.
3. House slops.
4. Liquid refuse from factories.
5. Surface water from roofs, yards, and streets.

There are two main systems of sewage disposal:—

1. The water-carriage system.
2. The dry system.

In the water-carriage system the whole of materials enumerated above are removed by means of a network of pipes or channels from the site of their production to the point or points selected for their disposal. In the dry system, the solid and a portion of the liquid excreta are excluded, and dealt with separately, the remainder of the sewage being dealt with as in the water-carriage system.

The sewage to be dealt with in the water-carriage system may be looked upon as water polluted with a great variety of matters—some held in suspension, some in solution. From analyses of London sewage made by Mr. J. Dibdin in 1883, it appears that the suspended matter amounted to ·0396 per cent., or 56·6 grains per gallon, of which 54 per cent. was organic and 46 per cent. was inorganic.

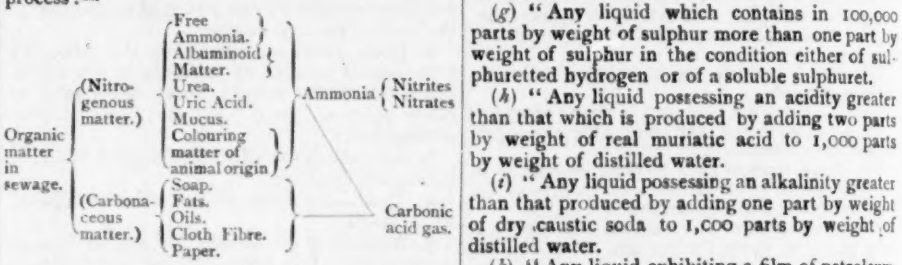
Exclusive of manufacturing refuse sewage is mostly animal in its origin, and much charged with nitrogenous and carbonaceous matters, which are more or less easily decomposed by so-called secondary decomposition, induced principally by the oxidising action of the oxygen of the air.

The nitrogenous matters consist of urea, uric acid, colouring matters of animal origin, mucus, and various bodies in a state of unstable equilibrium, somewhat resembling albumen in their chemical characteristics, and called generally, for the want of a better term, "albuminoid matter." "Manufacturer's sewage, or the waste waters from all kinds of chemical works, dye works, bleach works, paper mills, &c.:—As a rule this class of sewage is not rich in nitrogenous matters, but it is generally rich in carbonaceous matters, both in solution and suspension, and highly charged with various salts in solution. The substances in this class of sewage are more stable than those present in domestic sewage; consequently they are not so easily decomposed or oxidised, and their presence in a mixed sewage is therefore highly objectionable, because they actually prevent to a very great extent the oxidation and destruction of domestic sewage, and act as a 'resist' to the oxygen of the air." The decomposition of raw sewage or effluents which is brought about by micro-organisms or other causes is termed "Secondary decomposition."—"Burghardt, Transactions Municipal and County Engineers," Vol. XVIII., p. 306.

When sewage is freely exposed to the action of the air, and decomposition thereby facilitated, its complex organic constituents are split up, and ammonia and carbonic acid gas are produced.

Finally, the ammonia is converted into nitric acid, which combines with the alkaline bases present in the sewage and forms nitrites and nitrates.

The following diagram is illustrative of this process:—



This indicates the process of sewage purification, and is the object that should be aimed at in sewage disposal. By this means the organic constituents of sewage are converted into inorganic compounds, and rendered innocuous and suitable for the food of plants.

If, on the other hand, air is wholly or partially excluded, ammonium sulphide and other poisonous compounds are produced, resulting in offensive and dangerous conditions.

This decomposition of organic matter was originally attributed solely to the oxidising action of the air, and it is only recently that the researches of Schloessing, Frankland, Warrington, and others have shown that the process is brought about by minute vegetable organisms, known almost indiscriminately as microbes, germs, and bacteria. Pasteur, as stated by Duclaux, concluded that "wherever or whenever there is decomposition of organic matter of a herb or an oak, of a worm or a whale, the work is exclusively done by infinitely small organisms. They are the important, almost the only, agents of universal hygiene; they clear away more quickly than the dogs of Constantinople or the wild beasts of the desert, the remains of all that has had life; they protect the living against the dead: they do more, if there are still living beings, if, since the hundreds of centuries the world has been inhabited, life continues, it is to them we owe it." (Sims Woodhead: "Bacteria and their Products," p. 68.)

Analytically, the composition of sewage is very variable, but the following figures obtained from the first Report of the Rivers Pollution Commissioners, which are the averages of a large number of analyses of samples of town sewage, are fairly representative. The results obtained from water-closet towns and midden are given separately, but the sub-division is useless for purposes of comparison.

No standard of purity of sewage effluents has been legally adopted, and it is more than doubtful if any standard would be practically possible. The following limits of pollution beyond which liquid should not be admitted into streams was suggested by the Rivers Pollution Commissioners.

(*a*) "Any liquid containing, in suspension, more than three parts by weight of dry mineral matter, or one part by weight of dry organic matter in 100,000 parts by weight of the liquid.

(*b*) "Any liquid containing in solution, more than two parts by weight of organic carbon, or 0·3 parts by weight of organic nitrogen in 100,000 parts by weight.

(*c*) "Any liquid which shall exhibit by daylight a distinct colour when a stratum of it one inch deep is placed in a white porcelain or earthenware vessel.

(*d*) "Any liquid which contains in solution, in 100,000 parts by weight more than two parts by weight of any metal except calcium, magnesium, potassium, and sodium.

(*e*) "Any liquid which in 100,000 parts by weight contains, whether in solution or suspension, in chemical combination or otherwise, more than 0·05 part by weight of metallic arsenic.

(*f*) "Any liquid which, after acidification with sulphuric acid, contains in 100,000 parts by weight more than one pint by weight of free chlorine.

(*g*) "Any liquid which contains in 100,000 parts by weight of sulphur more than one part by weight of sulphur in the condition either of sulphuretted hydrogen or of a soluble sulphuret.

(*h*) "Any liquid possessing an acidity greater than that which is produced by adding two parts by weight of real muriatic acid to 1,000 parts by weight of distilled water.

(*i*) "Any liquid possessing an alkalinity greater than that produced by adding one part by weight of dry caustic soda to 1,000 parts by weight of distilled water.

(*k*) "Any liquid exhibiting a film of petroleum or hydrocarbon oil upon its surface, or containing in suspension in 100,000 parts more than 0·05 part of such oil."

The following explanation of Chemical Terms employed in the analysis of sewage is taken from a report by Dr. C. A. Burghardt to the River Conservancy Committee of the county borough of Salford.

Free Ammonia.—This is the ammonia formed to a great extent, but not entirely, from the nitrogenous matters in the sewage by oxydation and reduction. It is quite harmless, as it exists mostly as ammonium salts.

Albuminoid Ammonia.—This is ammonia obtained in the process of analysis by a special chemical splitting up of the so-called albuminous nitrogenous matters in solution and suspension, the nitrogen of this organic matter being caused to combine with hydrogen, thus producing ammonia, which is distilled off as gas, and its amount carefully estimated. The method of determining the free and albuminoid ammonia is that known as the Wanklyn Process. "Albuminoid Ammonia, therefore, mostly represents sewage contamination in a water, consequently its amount in an effluent is an important consideration.

Oxygen Taken up in Three Hours.—On adding a solution of permanganate of potassium to a water containing oxydisable organic matter, the permanganate becomes decolourised on account of its giving up a portion of its oxygen to destroy and oxydise the organic matter. When enough permanganate of potassium has been added to oxydise the sewage, in other words, until no further discolourisation takes place, then, any excess of the permanganate solution in the water imparts a beautiful magenta-pink colour to the latter. By making a permanganate solution of a known strength, the chemist can ascertain exactly how much oxygen a known volume of the perman-

Average Composition of Sewage in Parts per 100,000.

Description.	Total Solid Matters in Solution.	Organic Carbon.	Organic Nitrogen.	Ammonia	Total Combined Nitrogen.	Chlorine.	Suspended Matters.		
							Mineral.	Organic.	Total.
Midden Towns	82·4	4·181	1·975	5·435	6·451	11·54	17·81	21·30	39·11
Water-closet Towns .	72·2	4·696	2·205	6·703	7·728	10·66	24·18	20·51	44·69
In Grains per Gallon.									
Midden Towns	57·68	2·926	1·382	3·804	4·515	8·078	12.467	14·910	27·377
Water-closet Towns .	50·54	3·287	1·543	4·692	5·410	7·462	16·926	14·357	31·283

ganate solution will give up to a known volume of the water or sewage, say in three hours. The oxydisable matter, therefore, present in the sewage is expressed in terms of oxygen required to oxydise it in three hours. This process is known as Tidy's method. This method does not really oxydise all the organic matter, but it gives a good comparison between waters and sewages.

Organic Matter in Suspension.—This largely consists of fœcal matter in sewage; therefore its reduction in amount is a most important consideration, as its presence causes secondary decomposition to arise, and consequent nuisance.

Organic Matter in Solution.—This is the loss obtained in the analysis by burning off all the matters in the total solid matter (obtained by evaporating a know volume of the water or sewage to complete dryness and weighing), which are volatile at a red heat, taking the necessary precautions to avoid loss of carbonic acid natural to the sewage by this heating. This organic matter includes all the nitrogenous and carbonaceous matter present in the sewage; therefore, also, the free and albuminoid ammonia.

Mineral matter in solution and suspension need not be taken into consideration:—"Sewage Treatment," p. 71.

Raw or Crude Sewage.—Sewage as delivered at the outfall and before treatment.

Clarified Sewage.—Sewage freed from solid matters in suspension.

Purified Sewage.—Sewage the organic constituents of which have been converted into inorganic compounds.

Tank Effluent.—The liquid flowing away from the precipitation tank.

Sludge.—The semi-liquid matter or mud left behind in the precipitation tank.

Disenfictants destroy bacteria.

Antiseptics arrest or impede the growth of bacteris, but do not destroy them.

Deodorants destroy or mash effluvia, but do not affect bacteria.

APPOINTMENTS.

Chief of Public Works Department, Cyprus.—It is stated that Mr. Frank Cartwright, engineer and surveyor, eldest son of Mr. Joshua Cartwright, the Borough Engineer for the Bury Corporation, has been appointed chief of the Public Works Department at Cyprus. The appointment is one made from the Colonial Office, and carries with it a commencing salary of 600*l.* a year.

Carlisle City Surveyorship.—At a meeting of the Carlisle Town Council, on the 13th inst., Mr. Henry C. Marks, Borough Surveyor and Water Engineer of Dewsbury, and Water Engineer to Dewsbury and Heckmondwike Waterworks Board, was appointed City Surveyor, at a salary of 450*l.* per annum. There were fifty-seven applicants for the post, and these were reduced to seven, and eventually to three, of whom Mr. Marks was one, the other two selected being Mr. Henry Dearden, Borough Surveyor, Batley, and Mr. F. Campbell, Borough Surveyor, Stockton-on-Tees.

Surveyorship, Cork.—Mr. Henry A. Cutler, A.M.Inst.C.E., Borough Engineer and Surveyor of Rawtenstall, has been appointed Engineer and Surveyor for the City of Cork, at a salary of 500*l.* per annum, with the privilege of taking three pupils. Mr. Cutler's appointment was the result of a competitive examination, which was held in Dublin on the 23rd, 24th, and 25th ult. The examiners were Mr. Clement Dunscombe, M.Inst.C.E., Mr. Spencer Harty, M.Inst.C.E., and Mr. Jos. C. Bretland, M.Inst.C.E. There were thirty candidates, and eighteen sat for examination, but after the morning sitting of the first day one retired. In their report the examiners unanimously recommended the three gentlemen whom they have designated "A," "B," and "C," giving the percentage of marks obtained by each, viz.:—"A," Mr. Cutler, 76 per cent.; "B," Mr. Frank Wood, City Engineer's Office, Wakefield, 60 per cent.; "C," Mr. W. Fitzgerald-Barry, Kilkenny, 58 per cent.

OBITUARY.

Mr. W. H. White.—Mr. William H. White, for over eighteen years the Secretary of the Royal Institute of British Architects, died on Tuesday at his residence in Oxford and Cambridge Mansions. Mr. White, who was born in January 1838, was the son of Dr. William White, of the Bengal Medical Service. Early in life he went to reside in France, and after a brief term as assistant to a French architect, started practice for himself in Paris, but the outbreak of the Franco-Prussian war in 1870 compelled him to leave Paris. In 1871 he went to India, and was engaged in the Public Works Department of the Indian Government. Returning to London in 1873, he was appointed examiner in architecture at the Royal Indian Engineering College, Cooper's Hill, and in 1878 he was appointed secretary to the Royal Institute of British Architects. The deceased gentleman, whose funeral took place at Nunhead Cemetery on Thursday, was at one time a regular contributor to the *Builder*.

M. Désiré Devrez.—The Société Centrale des Architectes of France has lost one of its most esteemed members by the death of M. Désiré Devrez, at the age of 72. After having studied at the École des Beaux-Arts, under the direction of Horeau and Laisné, M. Devrez was attached to the Architectural Department of the Paris Municipality. Having been appointed architect to the XVth Arrondissement, he built a good many municipal edifices, among them the Mairie of Vaugirard. He was also attached to the "Ministère des Cultes" and to the "Commission des Monuments Historiques," and held the post of diocesan architect successively at Orléans and at Meaux. He possessed a fine artistic taste and a great deal of practical experience. He carried out some interesting work on Mont St. Michel, and exhibited at the Salon of 1861 some interesting studies relating to the restoration of some houses at Rouen and Orléans which are remarkable types of the civil architecture of the fourteenth, fifteenth, and sixteenth centuries. He received the decoration of the Legion of Honour in 1867, and obtained a "Seconde Medaille" in the general exhibition of 1868. He was also latterly a member of the "Conseil d'Architecture" of the Municipality of Paris, and Honorary Inspector-General of Diocesan Buildings.

Mr. G. V. Alsing, C.E.—At a meeting of the Glasgow Sewage Committee, on the 12th inst., a minute was passed expressing deep regret at the death of Mr. G. V. Alsing, C.E., Consulting Engineer of the Committee. Mr. Alsing's connexion with the city dates back four or five years, when he was engaged to design the sewage works afterwards erected at Dalmarnock. Mr. Alsing was a native of Denmark.

Mr. Richard Sapcote.—The death has just taken place of Mr. Richard Sapcote, a member of the firm of builders of that name in Camden-street, Birmingham. He was born in Birmingham, educated at King Edward's School, and afterwards entered his father's business, of which he was one of the principals for many years.

GENERAL BUILDING NEWS.

Cheltenham College New Chapel.—On the 13th inst. the Lord Bishop of Gloucester and Bristol consecrated the new chapel which has been erected to commemorate the jubilee of Cheltenham College, which occurred in 1891. The building is a parallelogram, in the Gothic style. The ground plan is 164 ft. by 49 ft. 6 in., and the floor space inside is 148 ft. 5 in. by 33 ft., which will give seating accommodation to 650 boys, fifty masters, the college servants, and about 150 visitors. The chapel is built of Cleeve Hill stone, with red Farleigh stone for dressings. One of its chief architectural features is the east window, which is 26 ft. wide, while its height is 25 ft. At present only the shell is erected, and this at a cost of about 13,000*l.* Messrs. Middleton, Prothero, and Phillott were the architects (Mr. Prothero's design having been accepted in a competition). Messrs. Collins & Godfrey were the builders. The building has been illustrated in the *Builder* for August 5, 1893, and June 1, 1895.

Reconstruction of Municipal Buildings, Aberdeen.—Mr. William Young, architect, London, in advising the Aberdeen Town Council how to proceed in this matter, substantially recommends the carrying out of competitive design No. 4 (by Messrs. Souttar, Aberdeen) subject to amendments. Mr. Young suggests providing for the housekeeper outside the building, so as to leave the third story available for offices, &c. The other chief proposals are as follows:—A new town hall would be provided by alterations on the former police buildings, and the present town hall divided into two committee-rooms. The cost would be about 10,679*l.*

New School, Aberdeen.—Aberdeen School Board has resolved to erect in King-street a new public school for 552 pupils. The buildings will be on the site at the existing small school for Old Aberdeen district, and the present structure will be converted into gymnasium, manual instruction room, and cookery room. The new building (which is so designed that the accommodation can afterwards be doubled) will be erected from plans by Mr. J. Ogg Allan, the Board's master of works. The estimated cost is 5,350*l.*

Theatre for Stoke Newington.—Official notification has been received by the freeholder of a building site at Stoke Newington-road that within a month the erection of a theatre will be commenced from plans by Mr. Frank Matcham. The site exactly faces the North London Police-court, and it has the advantage of abutting upon three roads—Stoke Newington-road (124 ft.) for the front, and Princess May and Wiesbaden-roads, the left and right, for stage and gallery entrances.

Schools, Ashton-upon-Mersey.—The day and Sunday schools in connexion with St. Mary's Church, Ashton-upon-Mersey, were opened recently by the Bishop of Chester. These schools have been built from the designs and under the superintendence of Messrs. Whitelegg & Whittaker, architects, Manchester, by Mr. John E. Dean, of Ashton-upon-Mersey, general contractor. The schools accommodate 300 children, and the whole has been arranged so as to make the building suitable for parochial purposes. The rooms are divided into class-rooms, by Messrs. Peace & Norquoy's movable screens, and the heating has been done by Messrs. Harlow & Sons.

Wesleyan Church, Ilkeston, Derbyshire.—On the 14th inst. the memorial stones of a new Wesleyan Church were laid in Bath-street, Ilkeston. The plans for the new building have been prepared by Mr. George Haslam, architect, Ilkeston. The new church will be a Gothic structure, with tower and spire at the south-east corner. The front will have four entrances, approached by flights of steps. The accommodation will be for 728. A gallery which runs round the edifice will accommodate nearly 300. The land runs up, so that the gallery can be approached from the old chapel at the back, almost on a level. The interior is cruciform on plan, and at the front are lobbies, and at the rear vestry and other accommodation. The spire will reach a height of 120 ft. above the floor-level. The cost of the erection and of the land is estimated at nearly 5,000*l.*

Congregational Church, Newcastle-on-Tyne.—The foundation stones of a new Congregational Church at the corner of Beech Grove and Westmorland-roads, Newcastle, were laid on the 14th inst. The buildings, which have been designed by Mr. Stephen Piper, of Newcastle, are to cost 8,000*l.* Mr. G. H. Mauchlen is the contractor. The church is to consist of a wide nave, with transepts and passage aisles, and the main entrances will be in Westmorland-road and Beech Grove-road. There will be accommodation for 700 adults in the church. There are ladies' and gentlemen's cloak-rooms at the main entrance, leading out of a vestibule, and a deacon's vestry. The minister's vestry, with lavatory attached, is on the north-east side of the church. The school or hall is at the north end of the site, with two main entrances and staircases leading up to class-rooms on galleries. At the back of the school or hall, near the platform, are ladies' and gentlemen's cloak-rooms, and a kitchen. There is also an infants' class-room. A church parlour is placed on the first floor, and adjoining is a large room to accommodate 100 adults. Mr. J. Richley is clerk of works.

Leeds and Roundhay-road Constitutional Club.—The members of this institution, finding their existing club inadequate for their accommodation, have resolved upon acquiring new premises. The building, plans for which have been prepared by Messrs. Swale & Mitchell, architects, Leeds, will be of an oblong shape, facing Roundhay-road; extreme dimensions, 96 ft. by 40 ft. On the basement, at the rear of the premises, a room will face the bowling green, which can be used as a smoke-room for the convenience of members using the bowling green. The ground floor will contain a room 51 ft. by 37 ft. and 16 ft. high, in which will be placed four full-sized billiard tables; also on the ground floor will be a card-room, smoke-room, reading-room, and bar, with a living-room for steward. The upper floor will consist of a lecture-hall or meeting-room, 37 ft. by 51 ft., with a suite of ante-rooms and steward's bedrooms.

Proposed Shap Church Restoration, Westmoreland.—At a recent meeting of parishioners of Shap Church, a report was read upon the proposed church restoration, and the plans of the architect, Mr. G. D. Oliver, Carlisle, were on view.

New Hotel, Kingussie, N.B.—Tenders have been accepted for the erection of a new hotel at Kingussie. The design for the building has been prepared by Mr. A. Mackenzie, C.E., Kingussie. The contractors are:—Mason, Mr. James Macdonald, Kingussie; carpenters, Messrs. Dunbar, Elgin; slaters, Messrs. Butchart, Pitlochry; plasterers, Messrs. Birdie, Elgin; plumber, Mr. Wink, Nairn; painter, Mr. Chisholm, Kingussie.

Hall, Free Church, Downfield, Forfar.—On the 9th inst. the members of the congregation of the Mains and Stratmartine Free Church met to take part in the opening ceremony in connexion with the additions and improvements to the hall, which have just been completed. Mr. A. Johnston was the architect. The contractors were:—Mason work, Messrs. Robertson & Macpherson; joiner work, Mr. A. M'Laren, Lochee; plaster work, Messrs. Potts & Dand; glass work, Messrs. R. B. Farquharson & Son; slater work, Messrs. Fyffe & Co.; plumber and gas work, Messrs. J. Murray & Son; painter work, Mr. D. Stewart.

Convalescent Home, Cranbrook, Kent.—The foundation stone of a Convalescent Home at Cranbrook, Kent, in connexion with the Metropolitan Hospital, Kingsland-road, N.E., was laid recently. The builders are Messrs. J. Wood & Son, Brighton, and Mr. C. Grieve is the architect.

Independent Chapel, Barnsley.—The memorial stone of an Independent Chapel, now in course of erection at Sheffield-road, Barnsley, was laid on the 15th inst. by Alderman Batty Langley, M.P., of Sheffield. The building was designed by Mr. George Moxon, and it is to be of stone. The entrance will be through vestibules, each having a staircase to the end gallery, which will extend the full width of the front, and be divided into compartments by glazed swing doors. The body of the chapel will have two longitudinal

aisles, and modern seating, with rostrum, and provision right and left for the choir. The roof will be open timbered, the internal woodwork of pitch-pine, and the windows glazed with tinted glass. Ministers' vestries, class-rooms, &c., will be provided, and, the accommodation being for 400, provision for enlargement will be made.

Business Premises, City Road, London.—New premises for Mr. T. J. Lipton have just been opened in the City-road. The architects of the new premises are Messrs. King, of Fenchurch-avenue; the builders, Messrs. Grover & Son. The premises are built of white stone and red brick. They are lighted by electricity throughout, the plant and installation having been carried out by Messrs. J. H. Holmes & Co., of London.

Women's Shelter Home, Horfield, Gloucestershire.—A Women's Shelter Home is being erected at Horfield for inebriate women and homeless discharged prisoners. The plans from which the building is being erected are those of Messrs. Moncrieff & Rowley, and the builders entrusted to carry them out, and to complete the interior of the ground and first floors, are Messrs. Hughes & Weekes. The committee decided to adopt the course of dividing the work, so that part might be put in hand at once.

Business Premises, Belfast.—New premises have just been erected in Belfast for Messrs. R. Watson & Co. The new building occupies a site between Little Donegall-street and Library-street. It consists of four floors, which are divided into workshops. Of the floors the entire construction is fireproof, and provision has been made for the entrance and exit of workers by wide stairs at each end of the building, while a large steam-driven hoist is placed close to the goods entrance. The establishment is lighted by electricity by the company's own dynamos. Mr. James Kidd was the builder, the works being carried out from the designs of Mr. William J. Fennell, architect. The electric lighting was done by Messrs. Wm. Ccates & Son, under the supervision of their engineer, Mr. Stanley Dashwood.

Higher Grade School, The Meadows, Nottingham.—The Education Department has approved the plans for the construction of new Higher Grade Schools in the Meadows. The new building will consist of four blocks. In one which is three stories high, there will be accommodation for 402 girls on the ground floor and for 502 boys on the first floor, while on the second floor will be organised science rooms. The infants' school will be a building of one story to accommodate 230. In a third block (two stories) will be a laundry centre for fifty girls, a dinner-room for twenty girls, another similar room for a like number of boys, and a gymnasium about 44 ft. by 22 ft. Then there will be the caretaker's house. The building will be of brick, with Ruabon stone facings, and stone or terra-cotta bands and dressing. In the competition for the school, the assessor, Mr. E. R. Robson, F.S.A., selected the design of Mr. R. Clarke.

Mission Church, Grangetown, Cardiff.—On the 10th inst. memorial stones were laid at Avoca-place, Court-road, Grangetown, Cardiff, of the St. Barnabas Mission Church, erected in connexion with the parish of St. Paul's. The new building is being erected by Mr. Oliver Purnell from the plans of Messrs. Seddon & Carter, and will contain a room 60 ft. by 25 ft., affording accommodation for 250 or 300 people. The site, however, is large enough for the erection of a clergy house in addition.

Church, Bilsdale Midgable, Yorkshire.—The Archbishop of York consecrated the new church of St. John, with burial-ground, at this place recently. The building has been erected from the designs, and under the supervision, of Mr. Temple Moore, and it consists of a nave and chancel under one roof, with a north aisle and vestry, and western tower and spire. The east window represents the Crucifixion. The church is built of the local stone from Lord Feversham's estate, and the accommodation is for about 140 worshippers. The contractor for the work is Mr. William Brotton, of Bilsdale.

Primitive Methodist Chapel, Aspatria, Cumberland.—A new Primitive Methodist chapel, built at a total cost of over 1,500*l.*, was recently opened at Aspatria. The new church is built in the Gothic style from plans prepared by Mr. W. G. Scott, architect, Workington. The two entrance doors are in the front, opening into a vestibule, out of which lead the gallery stairs, a vestry, and two vestibule doors into the main body of the church, which has accommodation for 230 people, while the gallery has accommodation for an additional 50. It is lighted by a three-light tracery window in the front, and lancet windows on the sides.

Rebuilding of the Old Bailey Sessions House.—At the last meeting of the Court of Common Council, Mr. Wallace presented a report from the City Lands Committee relative to the proposed rebuilding of the Sessions House, and submitting sketch and plans for the new Central Criminal Courts in the Old Bailey. The City Surveyor, in response to a request to make a statement on the probable cost of the scheme, said he could not give a close estimate, but so far as the present plans were concerned, if they were adopted, there would be an expenditure of 120,000*l.* Mr. King suggested that the report should be printed and a copy sent to each member. The Court agreed to the proposal to print and circulate the report, which, it was understood, after being submitted to her Majesty's Judges, will come back to the Court for the discussion of all necessary questions.

New Vicarage, Bitterne, Hants.—This building has just been completed. The builders are Messrs. Witt Bros., of Bitterne, and the architect is Mr. A. J. Colson, Winchester.

Restoration of Llancillo Church.—On the 16th inst. the Welsh Parish Church of St. Peter, Llancillo, near Abergavenny, was re-opened by the Bishop of Hereford, after undergoing restoration. The work of restoration has been carried out by Mr. Newton Taylor, of Hereford, the architect being Mr. Godsell, also of that city.

Proposed Extensions of Swimming Baths, Rochdale.—At the recent meeting of the Building, Baths, Parks, and Cemetery Committee of the Rochdale Town Council, the Committee instructed the Surveyor (Mr. S. S. Platt) to prepare a plan showing how the baths can be carried further back on the vacant land behind the present building, and to submit an estimate of the cost.

Reconstruction of the Star Theatre of Varieties, Dublin.—The reconstruction of this building has just been commenced. The architect is Mr. R. Henry Brunton, M.Inst.C.E., London; and the builder will be Mr. Dalton, Ranelagh. The proscenium opening will be 35 ft. wide by 30 ft. high, and the stage will have a depth of 30 ft. The stage is separated from the auditorium by a fireproof curtain. The floors of the house will be of iron and concrete, and the partitions enclosing the passages to the house and also to the private boxes will be of fireproof block. The exits will be of the width specified by the Corporation by-laws—namely, not less than 4 ft. 6 in., and all the doors in these will be fitted with "panic" bolts. The stage will be placed at the back of the premises in Dame-street, and the auditorium will be in the space between Sycamore-street and Crampton-court, having the refreshment-bars behind it. This arrangement will enable exits to be made on both sides of the house. The accommodation of the theatre will consist of about 110 orchestra stalls and 350 pit stalls on the ground floor. Above this there will be a balcony with about 400 seats, and above the balcony there will be two galleries having seating accommodation for some 700 people. Besides these there will be six private boxes on each side of the stage.

Chemistry Department, Aberdeen University.—The new chemistry department at the Aberdeen University has just been brought into use. The new department occupies almost the whole of the extension towards Broad-street of the north wing of Marischal College quadrangle. The building occupied by the department is about 90 ft. in length by 60 ft. in breadth, and consists of three floors—a basement for storage purposes, &c.; a ground-floor, constituting the science department, and a first-floor, constituting the medical department, and containing the general lecture-room. The plans for the building were prepared by Mr. A. Marshall Mackenzie, A.R.S.A., and they form part of the designs for the general extension of the college. The walls of all the rooms, with the exception of the library and the professor's room, are lined with white glazed bricks, relieved by an occasional row of yellow bricks of the same type. The floors of the building consist, for the most part, of pitch-pine parquetry, laid on concrete. The woodwork is of yellow pine varnished. The whole of the department is fitted with the electric light.

Theatre, Chesterfield, Derbyshire.—The new theatre which has been in course of erection in Corporation-street, Chesterfield, during the last six months is now practically completed. The new building has been erected on the site of the old wooden erection adjacent to the Midland Railway station. Accommodation has been provided in the new structure for some 1,300 or 1,400 people. Externally the new structure is, in the lower front, of stone, while in the upper part it is red brick, with stone dressings, and surmounted by stone pediments and balustrades. Four principal entrances from the front have been provided, but there are fifteen exits in all. In the interior an asbestos curtain for the stage front has been provided. The architects from whose designs the new theatre has been constructed are Messrs. Rollinson & Son, Chesterfield; and Messrs. Green & Co., Rotherham, have had the building contract. The new building is to be known as the Theatre Royal.

Business Premises, Chesterfield.—New business premises have just been erected in Burlington-street, Chesterfield, from the designs of Mr. W. Cecil Jackson, architect.

Proposed Artisans' Dwellings, Birmingham.—The Improvement Committee of the Birmingham Corporation are able to announce definite progress in the scheme for utilising the space commonly known as the Milk-street area, from which, under the combined powers of the Health and Artisans' Dwellings Acts, they some time ago cleared a large number of insanitary dwellings. In all they rased or emptied seventy-two so-called houses, and under the governing statutes the municipality is required to provide accommodation for at least half the number of families displaced. At the meeting of the Committee on the 12th inst. plans were submitted and approved for the erection of sixty-four "dual houses." The plans, which have been prepared by Mr. P. Addie, the secretary and manager of the Improvement Department, will now go forward to the City Council, and on their adoption by that body will be submitted to the Local Government Board for approval and the consequent authority to borrow money to erect the proposed dwellings. The main elevation resembles that of an ordinary terrace of small two-storied houses, but internally each floor will be a complete dwelling, consisting of a living room and two bedrooms, with respective areas of 12 ft. 9 in. by 10 ft. 6 in., 11 ft. by 9 ft. 6 in., and 11 ft. 4½ in. by 8 ft., and a scullery 9 ft. 6 in. by 8 ft. on the other side of a corridor running behind the living and sleeping rooms. Adjoining the sculleries will be separate sanitary offices for each dwelling. The entrance to the ground-floor houses will be by an ordinary doorway on the street level, and to the upper dwellings, which are identical in area and accommodation, by way of an enclosed external iron staircase and gallery, which is continued round the ends of the blocks to the upper corridor. The sculleries and sanitary offices will occupy only half the lineal area of the living and sleeping rooms, and the intervening spaces will be left open to secure ample ventilation, though the whole area will be under cover. The site contains 4,040 square yards, and the buildings will cover about two-thirds of this, leaving a considerable space for yards. The committee, with the sanction of the City Council, do not propose to erect the whole of the sixty-four dwellings at once. Their intention is to raise half that number, and to be guided by their experience in regard to these as to the completion of the scheme or otherwise.

Catholic Church, Kirbymoorside, Yorkshire.—The foundation stone of a new Catholic church was recently laid at Kirbymoorside. The new church is from plans by Mr. Bernard Smith, of London, and when completed will seat 120 persons. It is to be built in the Early English style. The church is designed to consist of sanctuary, 16 ft. by 16 ft. internal dimensions, and 29 ft. to ridge; nave 40 ft. 4 in. by 20 ft., and 31 ft. to ridge; with priests' sacristy and boys' sacristy, with heating chamber under, on the north side; and a south porch. The exterior will be faced with a local stone from Sleightholmdale and lined with bricks. The east window will be of three lights; there will also be a three-light window in the south side of the sanctuary, with piscina under. There are to be five lancet windows in the nave, and at the west end there will be a three-light window 20 ft. by 12 ft. Three steps of white Carrara marble lead from the nave to the altar. The sanctuary and porch are to be paved with encaustic tiles. The sanctuary will open to the nave by a lofty arch. The nave and vestries are to be paved with wood blocks. At the west end of the nave is to be placed the holy water stoup of Carrara marble; also the font, consisting of base of polished West Riding stone, shaft and capital of Roche Abbey magnesian limestone, and octagonal font of Carrara marble. The roof timbers will be of Memel, with trusses springing from moulded corbels, and covered with Welsh slates. The whole of the windows are to be glazed with cathedral glass. The work is being carried out by Mr. Anthony Lyons, contractor, of Norton, Malton. Mr. H. Bolton, of Norton, is acting as clerk of works.

Tower, St. James's Church, Bristol.—The tower of St. James's Church, Bristol, has just been restored under the direction of Mr. J. Bevan. The original, which stands at the east end of the south aisle, dates from the latter part of the fourteenth century, but it had been altered and repaired from time to time.

Wilson U.P. Church, Perth.—On the 8th inst. the new church for the Wilson U.P. congregation, Perth, was formally opened for public worship. The principal entrance is in the centre, but there are auxiliary doors on each side. At the main entrance is a vestibule with cloakrooms adjacent, and from this vestibule lobbies lead to the area of the church and the galleries. At the hall entrance (from the side) another stair leads to the hall on the first floor, and the gallery is also accessible from this stair. The interior of the church is divided into a nave and side aisles by wide stone arches springing from piers at the end and columns in the centre. There is a gallery over the entrance end next the street, and also at each side over the side aisles, the side galleries being only three seats deep. At the opposite end of the building a stone arch covers the pulpit recess, and smaller arches on each side cover the organ chambers. The choir is placed in front of the pulpit platform, and the keyboard of the organ is also set there. The ceiling rises in a double curve from the walls to the main ceiling. There is pew accommodation for 904 persons, exclusive of the choir; 595 seats being in the area, and 309 in the front and side galleries. There is a large hall capable of holding 400 persons. The accessories include a session-hall, ladies' room, vestry, kitchen, and a church-officer's house of two rooms and kitchen, besides cloak-room and lavatory accommodation. The architect of the building was Mr. John B. Wilson, Glasgow. The cost of the building and organ is over 10,000*l.* The contractors were:—Messrs. Fraser & Morton, builders; Mr. Thomas

Forgan, joiner; Mr. James Buchan, slater; Messrs. John Mackay & Sons, plasterers; Messrs. W. Frew & Sons, plumbers and gasfitters, and heating; Messrs. Stalker & Boyd, painters; and Messrs. W. Meikle & Sons, Glasgow, glaziers. Mr. W. Campbell is measurer; and the clerk of works is Mr. James Murray.

CHURCH, CARLTON MINIOTT, YORKSHIRE.—The consecration of the new church at Carlton Miniott took place recently. The new edifice occupies the site of the ancient parish church, which had become so dilapidated as to be dangerous for the holding of Divine service. Mr. C. Hodgson Fowler, of Durham, was the architect. The new church consists of a nave and chancel, with organ chamber and vestry on its north side, and a shallow south porch. Mr. H. Harwood, of Mansfield, near Darlington, has been the contractor.

PROPOSED NEW THEATRE, RICHMOND.—The Lyceum Theatre, Richmond, Surrey, Limited, has been formed with a capital of 30,000*l.* to erect a theatre in Richmond, for which purpose a freehold site has been secured close to the railway stations. The architect is Mr. F. Brewer.

CHAPEL, CLYDACH, WALES.—Miss Louise Studt recently laid the memorial stones of the new Welsh Congregational Chapel at Pantycrwys, Clydach. The new chapel was designed by Mr. Wm. Williams, architect. Messrs. Thomas & Jones, Morriston, are the contractors for the building.

PAROCHIAL SCHOOLS, TUNBRIDGE WELLS.—The corner-stone was recently laid of the new parochial school now being erected in St. Barnabas parish, Tunbridge Wells. The schools are being built from designs by Alderman H. Cronk, and will cost over 5,000*l.*

INTERMEDIATE SCHOOL, ABERDARE.—Aberdare Intermediate School was opened a short time since. The building, which is situate on a plot of ground near the lower entrance to the Public Park and adjoining the Park Board School, has accommodation for 100 boys and 80 girls. The building, which cost some 5,000*l.*, was built by Mr. David Jenkins, of Swansea, the architect being Mr. John H. Phillips, Swansea, whose plans were selected in open competition by the assessor, the late Mr. Ewan Christian. A master's house is now in course of erection upon the site, the contractor being Mr. John Morgan, Aberdare, and the architect Mr. J. H. Phillips.

INFIRMARY, ISLEWORTH.—The new Brentford Union Infirmary was opened on the 16th inst. by the Duchess of Teck. The building has cost the Union over 30,000*l.* The site is a three-cornered piece of ground to the north of the workhouse proper and having frontages to the Twickenham-road and Park-road, Isleworth. The infirmary consists of six separate blocksof buildings and a nurses' home. The exterior walls of the buildings are composed of red bricks, relieved with blue Staffordshire bricks and white stone, while the roofs are slated. The blocks are arranged as follows:—In the centre is a building containing the offices. This building is flanked on either side by two pavilions, which contain wards, and in which there is a total of 248 beds. These wards are connected with each other, and with the administrative offices, by fireproof open corridors, and there is telephonic communication throughout all the buildings. Each of the four pavilions has a balcony. The nurses' home is situated at the most northern point of the site, and it is cut off entirely from the infirmary. The architect is Mr. W. H. Ward, of Birmingham, and his plans have been carried out by the builder, Mr. J. T. Messum, of Twickenham.

MANCHESTER WHITWORTH INSTITUTE GALLERIES.—The President and Council of the Manchester Whitworth Institute have just thrown open to private view their exhibition of works of art, as now rearranged in the new galleries of the Institute, in Whitworth Park, Manchester. In the past the art treasures of the Institute have been shown in Grove House, an old family residence within the Park, whose accommodation was so meagre that large portions of the collection had to be stored out of public view. Although the house remains, and is to be still utilised, two new galleries have been built at the rear, and as an instalment of a larger scheme which provides a future art museum of somewhat noble dimensions. Each gallery is 78 ft. long and over 30 ft. wide, with a height of 27 ft. in one case and 30 ft. in the other, from the floor to the highest point of the ceiling light. The roof, in each instance, is constructed with an outer skylight and an inner ceiling light, the latter segmental in form, and framed so as to divide the light into squares. The walls, 16 ft. in altitude, provide for a dado, 3 ft. high, of polished mahogany framing, with panels and raised mouldings, a clear space for hanging paintings, 9 ft. high, and above this the frieze. For filling in the frieze spaces carefully selected specimens have been introduced from the British Museums in the shape of portions of the Parthenon frieze, the Phigaleian frieze, and the friezes of the Mausoleum at Halicarnassus and the Nereid Monument. Heating and ventilation have had thorough attention on the part of the architect (Mr. J. W. Beaumont, Manchester), and an installation of the electric light has its place throughout the buildings. The chief feature in the art collection is an historical series of water-colours, showing the rise and progress of that branch of art in these islands during the last two centuries. Over 120 deceased artists are represented, in some cases by solitary examples, and in others by groups.—*Leeds Mercury.*

NEW WING, DERBYSHIRE ROYAL INFIRMARY.—On the 12th inst. a new wing of the Derbyshire Royal Infirmary was opened for the reception of patients. The cost of erection amounts to 12,000*l.* The architects were Messrs. Young & Hall, of London, and the builders, Messrs. Walker & Slater, of Derby. The new block is constructed in two stories, comprising two large wards and a number of smaller ones. The total accommodation provided is forty-two beds, and there is also a small operating theatre quite distinct from the general operating-room. The new wing forms part of the original scheme sanctioned by the Governors.

SCHOOL-ROOM, PENARTH.—On the 15th inst., the memorial-stones of a new school-room in connexion with Trinity Wesleyan Church, Penarth, were laid. The new building, the front of which will face Stanwell-road, is to be constructed according to designs prepared by Messrs. J. P. Jones, Budgen, & Co., the builder being Mr. John Jones, Penarth, the cost being estimated at 2,500*l.*

NEW BANK, CHESTER-LE-STREET.—Messrs. Archibald Smith & Stevens ask us to mention that the lift in this building, described in our last issue, was supplied by them.

SANITARY AND ENGINEERING NEWS.

EXETER SEWAGE DISPOSAL.—At the Exeter City Council on the 14th inst., the Sewage Disposal Committee presented a report from the Surveyor, Mr. Cameron, on the work of the plant at Belle Isle, for dealing with the sewage of St. Leonard's, on his septic tank system. So far as the trial had proceeded he was well satisfied, and the alterations suggested by the working of the plant were small. The deposit equalled about three tons, and had precipitants been used in the ordinary way the amount of wet sewage in the tanks would have equalled sixty tons. The Chairman recommended that the Surveyor be instructed to prepare plans for dealing with the whole of the sewage of the city on the septic tank principle, and that as soon as they were ready application be made to the Local Government Board for leave to borrow the necessary money; that the Town Clerk serve the usual notices, and be authorised to retain the services of five expert witnesses, who were to proceed to their investigation at as early a date as possible, and that the Local Government Board and the Devon County Council be invited to inspect and test the works now in operation.—Mr. Andrew moved the adoption of the report. It was estimated by the Surveyor that the whole scheme would cost about 35,000*l.* or 36,000*l.*, including the cost of the land on which the tanks would be constructed.—Councillor Wreford seconded the motion.—Mr. Perry suggested that, in preparing the plans, Mr. Cameron should keep in view the possibility of merging Heavitree sewage system into that of the city.—The report was unanimously adopted.

RECONSTRUCTION OF HOWFORD BRIDGE, RENFREWSHIRE.—At a recent meeting of the Renfrew County Council's Sub-Committee, appointed in connexion with Howford Bridge, a report by Messrs. Crouch & Hogg, C.E., was submitted. The reporters estimated the cost of work for a bridge 30 ft. wide, and approaches 40 ft. wide, at 5,800*l.*, exclusive of anything for land and engineering, or for removal of existing bridge and disused road. The present bridge, in their opinion, could be repaired, but in that case it would be necessary to permanently restrict the weight of traffic passing over it. The repairs would cost about 300*l.* The Committee agreed to meet with the Govan District Lunacy Board, proprietors of Hawkhead Asylum, before coming to any finding in the matter.

NEW DOCK, LLANELLY.—In connexion with the proposal that Sir Alexander Rendel should act as consulting engineer in connexion with the construction of the new dock at Llanelly, a letter has been received from him stating that his terms would be two per cent. upon the Parliamentary estimate. This would include his being responsible for the design and execution of the works, while Mr. Fowler, the resident engineer, would prepare the designs at Llanelly under his direction, with occasional visits to see him in London. At a meeting of the harbour commissioners it was decided that the terms of Sir Alexander be accepted. With reference to Mr. Fowler, it was decided that he be paid during the construction of the works an annual sum of 300*l.*, to include all the assistance he requires, railway fares, and expenses to London. It was further decided that instructions should be given to the engineers to prepare plans, specifications, and forms of tender.

BRIDGE OVER KELTNEY BURN, N.B.—Keltney new Bridge is situated about six miles from Aberfeldy, on the road from Aberfeldy to Fortingall and Glenlyon. The bridge crosses the stream about 100 yards lower down than the old one. The new bridge spans the stream with an arch 60 ft. wide. Messrs. Dunn & Watson, of London, designed the bridge. The mason work has been carried out by Mr. John M'Naughton, of Aberfeldy, and the steel work by Sir William Arrol & Co., who have both carried out their work under the supervision of Mr. George Meiklejohn.

PLYMOUTH MAIN SEWERAGE WORKS.—At a recent meeting of the Plymouth Borough Council Mr. Little moved the adoption of the recommendation of the Special Drainage and Fish Market Committee that application be made to the Local Government Board for authority to borrow 100,000*l.* for works and main sewerage, described in the report of Mr. Mansergh, C.E., and approved by the Council on February 19, 1895. Mr. Colwill seconded, and the motion was agreed to.

SEWERAGE SCHEME, DOUGLAS.—The Douglas Town Council considered on the 16th inst. the question of the appointment of an engineer to carry out the new main sewer to cost about 40,000*l.* A motion that Mr. F. Stevenson, of the firm of Messrs. Burstall & Stevenson, be retained upon terms quoted by him in a letter was carried by eleven votes to seven.

SEWAGE WORKS, TIBSHELF, DERBYSHIRE.—The Rural District Council of Blackwell having applied to the Local Government Board for sanction to borrow 1,000*l.* for works of sewage and sewage disposal for the parish of Tibshelf, an inquiry was held in the Wheat Sheaf Inn, Tibshelf, on the 10th inst., by Mr. Walter A. Ducat, an inspector of the Local Government Board. There were also present Mr. G. H. Hibbert (clerk to the Blackwell District Council), Mr. H. Walker (engineer to the Council), Mr. George Harrold (sanitary inspector), and others.

SEWAGE EXTENSION, LLANDRINDOD WELLS.—At the last monthly meeting of the Llandrindod Wells Urban District Council, an engineer was appointed to (if approved) carry out a scheme of sewer extension and sewage disposal. Mr. C. E. Atkinson, of Liverpool, was eventually appointed.

LOCAL SEWERS IN LONDON.—The London County Council have sanctioned, subject to a condition recommended by the Engineer, the construction of local sewers as follows:—Battersea, 2,110 ft. of 12-in. pipe and concrete sewer in Meteor, Northside, and Springwell roads, Springwell estate, Clapham Common. St. Martin-in-the-Field: 290 ft. of 12-in. pipe sewer and 80 ft. of 4 ft. by 2 ft. 8 in. brick sewer in May-buildings and St. Martin's-street. Lee: 62 ft. of 12-in. pipe and concrete sewer in Northbrook-road. Hampstead: 776 ft. of 12-in. pipe sewer in Ferncroft-road, 687 ft. of 12-in. and 531 ft. of 15-in. pipe sewers in Hollycroft-road, Platt's-lane, 617 ft. of 15-in. and 228 ft. of 12 in. pipe sewers in Fordwych-road, and 492 ft. of 12-in. pipe sewer in Rondu-road, Edgware-road.

SCARBOROUGH SEA WALL.—Some two years ago the Scarborough Corporation, by poll of the ratepayers, obtained sanction for borrowing the sum of 70,000*l.* for the construction of the proposed sea-wall to be built round the Castle Cliff so as to connect the north and south foreshores; the plan for which was drawn by the late Sir John Coode. It happened, however, that when the Corporation obtained tenders for the construction of the wall it was found that the sum mentioned would be insufficient by at least 10,000*l.*; consequently, the Corporation had to get the consent of the ratepayers before they could borrow this additional sum, and for this purpose a poll was taken last week, when the voting gave the Corporation the liberty to borrow the supplemental sum by a majority of 1,500 votes out of 4,252. The work will now be at once taken in hand under the charge of Mr. J. E. Everett, C.E., late of Southampton. Some modifications have been made on Sir John Coode's original plan, giving greater breadth to the roadways, &c. The work is intended to be carried on from both ends, and, as a large amount of material has been already stored up, plenty of hands can be at once set to work.

STAINED GLASS AND DECORATION.

WINDOW, WHICKHAM CHURCH, DURHAM.—The jubilee of the Rev. H. B. Carr as rector of Whickham is to be commemorated by the placing of a stained-glass window in the church. The work has been executed by Messrs. Wailes & Strang, of Newcastle. The window is situate in the east end of the south aisle of Whickham Church. It comprises four large lights.

WINDOW, PAKEFIELD CHURCH, SUFFOLK.—The parishioners of Pakefield have provided a new east window to commemorate the twenty-five years' ministry of their rector, the Rev. Lewis Price, and this has just been unveiled. The work has been executed by Mr. H. J. Salisbury, of St. Albans.

WINDOW, WESTEND CHURCH, SOUTHAMPTON.—The design by Sir Arthur Blomfield, the architect of Westend Church, Southampton, for the east window, is illustrative of the Te Deum, and will form a memorial of the late Edwin Jones, J.P.

STAINED GLASS WINDOW, ST. PAUL'S EPISCOPAL CHURCH, EDINBURGH.—The dedication of a stained-glass window placed in the south aisle of St. Paul's Episcopal Church has just taken place. The window consists of two tiers of three lights each, surmounted by tracery. The subject chosen for illustration in the upper tier represents Christ as "The Light of the World;" that of the lower, "Christ Giving Sight to the Blind." The glass is carried out in the period of the fifteenth century, in harmony with the other windows in the church. The window has been executed at the studios of Messrs. Ballantine & Gardiner, Edinburgh.

FOREIGN.

France.—The Direction de Beaux-Arts has just placed at the Bibliotheque Nationale, in front of the door of the Salles des Imprimés, a fine marble bust of Cardinal Amboise, which makes a pair with that of Cardinal Bourbon. Eighteen other busts of celebrated persons are to be placed in the Salle des Pas Perdus, and the statues of Colbert and Mazarin are to be erected in the Cour d'Honneur of the library.——The Administration Préfectorale has decided that the future "Alexandre III." bridge shall be made in steel in the principal parts, and that it shall have a single arch, like the Pont Mirabeau. The width will be 40 mètres. The two abutments of the bridge will rest on low arches, 23 mètres wide, which will serve as a way for the trams already established on the Cours-la-Reine.——The hall in the Louvre, containing the models of the monuments found at Delphi, has just been opened to the public.——The Conseil Général de la Seine has commissioned M. Lequeux, architect, to build a large hospital for old people at Bry-sur-Marne. It will be called "Hospice Favier," and is to be built on the top of a hill. It will be of brick and stone, and will have a façade of 148 mètres. A fine park surrounds the building, which will be completed in some months. The cost of the building is estimated at 800,000 francs.——The sum of 1,500,000 francs has been set aside for some important sanitary works to be carried out in the old portion of Marseilles, the unhealthiness of which is well known.——The monument to the singer Gustave Nadaud has just been inaugurated at Roubaix. The sculpture has been executed by M. Cordonnier, and the architectural portion by M. Lefebvre.——M. Bauhain, architect, and M. Guimberteau, sculptor, have been commissioned to execute the monument which the town of Annecy is going so raise to the memory of President Carnot. A veiled and seated figure of a woman lays her right hand on the arms of Savoy, in her left hand she holds a flag draped with crape. At the summit of the monument is a bust of Carnot. The inauguration of the monument will take place some time in the spring.——The jury on the competition opened in 1896 by the Société Nationale des Architectes de France, the subject for which was "a post and telegraph office for a town of 4,000 inhabitants," has awarded the 1st prize to M. Brunet, the 2nd to M. Despeyroux, the 3rd to M. Bergerat, and the 4th prize to M. Haubolt.

Building Inspection in Philadelphia.—In Philadelphia recently a building inspector was discharged for failing to report the faulty condition of some two and three story dwellings. A committee of building inspectors made a careful report upon the structures, from which the builders took exceptions, and appealed to Director of Public Safety Riter. Mr. Riter appointed a committee of experts, composed of Mr. George Watson, a master builder, Mr. A. J. Boyden, School of Architecture, University of Pennsylvania, and Mr. Howard S. Richards, engineer, to examine and report upon the construction. It is encouraging, in the interest of honest inspection and an impartial enforcement of the law, to note that the experts have approved of and confirmed the report of the inspectors' committee, and have recommended the changes outlined in that report. How thoroughly bad this construction was may be shown by the following extract from the inspectors' committee report:—"We have made a careful house-to-house inspection, and find numerous and serious violations of the law. Walls not plumb, and in some instances cracked; 9-in. party walls where there should be 13-in. walls. Front walls not tied to party walls in either first or second stories; bricks laid without joints being flushed up or cross joints put up, and in many places without any mortar whatever. Lintels not used properly, and in many cases there is no lintel at all over the frames. Flue linings not used properly. Inferior joist and roof rafters, in some cases being too short and spliced out with 1-in. boards. Chimneys lathed and plastered over, also heat pipes. The heat pipes have been run without protection to woodwork or studding. The chimneys are not tied into the walls. The walls in some cases are composed largely of bats. These houses are, in our opinion, dangerous, and have no redeeming features, and we advise that they be torn down to the foundation walls and the foundation walls examined before rebuilding commences."—*Engineering Record.*

MISCELLANEOUS.

Professional and Business Announcements.—Messrs. G. J. and F. W. Skipper, architects of Norwich, have removed their offices from Opie-street to No. 7, London-street.——Messrs. Carter & Co., Encaustic Tile Works, Poole, Dorset, have opened London offices and show-rooms at 43, Essex-street, Strand.——Messrs. W. H. Wilcox & Co. have taken premises at 34 and 36, Southwark-street, London, for the manufacture of their patent wire-bound suction and delivery hose, formerly manufactured in Dublin.

Bristol Building By-laws.—At the last meeting of the Bristol Town Council the Sanitary Committee reported that since the last occasion (in the year 1891) on which the Council made by-laws with respect to new buildings, power has been conferred upon Urban Sanitary Authorities to make by-laws with respect to the keeping of water-closets supplied with sufficient water for flushing, and for preventing buildings, which have been erected in accordance with by-laws made under the Public Health Acts, from being altered in such a way that if at first so constructed they would have contravened the by-laws. The Committee, in controlling the erection and alteration of buildings, and enforcing the abatement of nuisances, had felt the necessity for further powers in relation to the above-mentioned matters, and they had therefore prepared a series of by-laws thereon, which they submitted with their report. In order to simplify and consolidate the by-laws relating to buildings, the Committee propose to repeal the by-laws of January 13, 1891, and to re-enact them by the series submitted, and advantage has been taken of the opportunity to remedy some defects which have been found to exist in the by-laws of February 24, 1871. The principal alterations proposed to be made in the by-laws of 1871 are, that the builder of a new domestic building must now provide in front of the building an open space, 24 ft. wide, for the free circulation of air, consisting either of a garden or of a roadway, or both; that the open space attached to a domestic building erected since 1851 shall not be diminished to a greater extent than is set forth in new by-law No. 9; and that the lowest story of a new building shall be placed at such a level that it may be effectually drained into the public sewer at a point in the upper half diameter of the sewer. In the by-laws of 1871 the provision of open space was compulsory only in the rear or at the side of a domestic building; the diminution of the open space attached to buildings was prohibited only as regards buildings erected since February, 1871, the prohibition not being carried back, as in the proposed new by-laws, to the earliest period allowed by law; and the requirements with reference to the drainage of the lowest stories of buildings was not definitely stated. The by-laws now submitted have been approved by the Local Government Board, and the Committee, believing that they will enable the authority to exercise powers it is very desirable to possess, recommended the Council to make them, and to authorise the Committee to take the steps necessary to have them confirmed in accordance with the provisions of the Public Health Act, 1875.—Alderman Cope-Proctor, in moving the adoption of the report, said the powers now sought were possessed by nearly every other Urban Authority. Mr. Walls seconded the motion, and inquired if the Committee had power to erect houses on land well known to be liable to be flooded. Ald. Cope-Proctor said there was a by-law that the lowest story of a new building shall be placed at such a level that it may be effectually drained into the public sewer. If they had had such by-laws in the past a large quantity of low-lying land would not have been built on. The report was adopted, and the city seal was ordered to be affixed to the new by-laws.

Building Regulations, Burnley.—At the last monthly meeting of the Burnley Town Council Alderman Baron drew attention to the following paragraph, which appeared in the minutes of the Improvement Committee for October 1:—"The Sub-Committee considered certain amendments required in the building regulations made by the local Acts, and directed that such amendments be brought before the Parliamentary Sub-Committee with a view to an application for a Provisional Order to amend the Acts with regard to those matters. Resolved, that the minutes of the Sub-Committee be approved and adopted, and that the Council be recommended accordingly." There were many matters, he said, in connexion with the building regulations which the Committee were quite satisfied required altering. It was intended to provide that the Corporation should prescribe all building lines in streets, suitable, of course, to compensation, to any person suffering through having to give up land. And it was also intended to limit the period during which the approval of plans should have effect. It was now intended to provide that they should fix a time, which he thought was a very desirable thing, and it was also intended to alter the minimum space in connexion with the back-yards of houses. They were aware that the present space required was 120 square feet, and it was intended to alter that to 150 square feet. He believed that in the rural districts they had that regulation. It was also intended to impose penalties for draining sewage into sewers provided exclusively for surface water, and for draining surface water into sewers provided exclusively for sewage, and to make full provision required in connexion with the separate system of sewers. He thought that the Council would agree that something of that kind was necessary to be done. It was intended to make better provision for the ventilation of the drains, and it was felt that if that could be done it would conduce to great sanitary improvement. It was also intended to provide that the walls of new buildings should have hard and incombustible materials unless otherwise allowed by the Corporation. They had often passed plans for wooden buildings to be put up even in the main streets, and it was desirable that that should be altered. There were also a number of other amendments required. The whole of the amendments would be brought before the Parliamentary Sub-Committee, whose report would come before the General Purposes Committee, and notice would be given to the Council and the public before any change took place in the law applicable to the Corporation. The minutes were passed.

Proposed Electric Light, Bootle.—At the last usual monthly meeting of the Bootle Town Council a lengthy report, prepared by the Watch Committee on electric lighting, was submitted by the Mayor, who moved that the recommendations therein contained be approved and adopted. The report stated that, in view not only of the present requirements, but of the development of the town in the near future, the Committee made the following recommendations:—"That the supply of electrical energy for lighting and motive power should be kept in the hands of the Council, and not delegated or transferred to any other body; that the Council should resolve to put in force their powers under the Bootle Corporation Electric Lighting Order, 1895; that your Committee should be authorised to select a site for a generating station, recommend the system of supply, fix the area within which the supply should be given, determine whether and to what extent electricity should be used for street lighting, obtain tenders for the plant required, ascertain the capital sum which the Council would have to borrow for the scheme, and bring up a further report to the Council containing these particulars and such information as they may obtain; and that for these purposes the Committee should be empowered to obtain such expert assistance and advice as they may require." The cost of buildings, plant, and mains included in such a scheme is estimated by Mr. T. L. Miller, electrical engineer, Liverpool, at 21,000*l.* The motion was ultimately put to the Council and carried unanimously.

Proposed Crematorium for Cardiff.—A meeting of the Sub-Committee of the Cardiff Burial Board was held at the Town Hall on the 13th inst. The meeting considered the rules and regulations submitted by the Health Committee *re* crematoriums at the Flat Holm and Cardiff, and agreed to recommend the Committee to approve of the same. Subsequently the Sub-Committee, accompanied by the Borough Engineer (Mr. W. Harpur) proceeded to the cemetery to fix upon a site which they considered would be suitable on which to erect a crematorium.

Reredos, Farsley Parish Church, Yorkshire.—There has just been presented to the Farsley Parish Church a reredos, the material of which is oak. The total height from the floor to the top of the cross is 14½ ft., whilst the breadth is that of the chancel. The work has been executed by Mr. J. Taylor, of Yeadon, and the decoration was by Messrs. Powell Bros., of Leeds, the whole being from the designs by Messrs. T. H. & F. Healey, architects, of Bradford.

Olympia, West Kensington.—By an order of the High Court of Justice, Chancery Division, this freehold property will shortly be offered for sale, in one lot, at auction. The entire property, including the annexe and winter garden, covers rather more than 11 acres. The two halls were finished in 1886, after the designs of the late H. E. Coe, on whose resignation, owing to failing health, Mr. James Edmeston was appointed as architect, Mr. M. am Ende and Mr. A. T. Walmisley being the engineers and designers of the great iron roof. The big hall (formerly the National Agricultural Hall) is remarkable for its semi-circular roof, having a span of 170 ft. in the clear, illustrated, together with the staging erected for its construction, in our issue of May 29, 1886. See also the *Builder* of October 3, 1885, for drawings of Mr. Coe's elevation, with section and plan. Messrs. Lucas & Son's general contract amounted to 131,573*l.*, the ironwork being contracted for by Messrs. Handyside & Co., of Derby.

Scaffold Accident near Victoria.—An accident resulting in the death of two men and in serious injury to two others, happened on the 17th inst. in Vauxhall Bridge-road. Building operations are going on there, and a number of men were working upon a scaffold. Suddenly the platform collapsed, and crashed down to the ground, dragging with it four of the workmen. Of these two were killed on the spot, and the other two were seriously injured.

Electric Lighting Progress in Bradford.—At a meeting of the Electricity Sub-Committee of the Gas and Electricity Supply Committee of the Bradford Corporation on the 16th inst., Mr. W. C. Dixon presiding, it was decided, subject to the sanction of the Town Council, to lay an electric cable up Otley-road as far as the Peel Park Hotel, for the supply of electricity to shopkeepers and residents in that thoroughfare. The committee agreed that an exhibition of electrical appliances should be opened in the Swan Arcade. It was further determined to supply incandescent lamps, under certain conditions, free of cost, and to lend motors on hire.

Leeds Master Builders' Association.—The Leeds Master Builders' Association and Builders' Exchange Club gave a complimentary dinner recently to Councillor Hannam and the members of the Strike Committee who were instrumental in bringing the recent prolonged dispute in the building trade of Leeds to a close. The dinner was served at the Queen's Hotel. About seventy persons sat down. The chairman was Mr. Isaac Gould. Mr. Umpleby proposed the toast of the Master Builders' Association and Builders' Exchange Club. Mr. Chas.

Myers, in responding on behalf of the Master Builders' Association, said the recent lamentable strike, which extended over a period of five months, had, at any rate, taught the masters the lesson of union. The best way to prevent war was to be prepared for it when it came. The builders of the city ought to be federated into one compact body, so that they might at all times stand shoulder to shoulder in defending and promoting their mutual interests. Such a federation was desirable, not merely for the purpose of resisting unreasonable demands on the part of the men, but also for the purpose of helping each other. The masters fought each other ten times harder than the men had ever fought them. As a consequence, the master builders had to accept prices for their work that were utterly unreasonable. A strong combination such as he suggested would enable them to procure just remuneration for their work. Mr. W. H. Dews, who replied for the Builders' Exchange Club, mentioned that the membership of that organisation was now about 160. These included fifty master builders, and on behalf of these he volunteered to federate at once as suggested. "The Strike Committee," which was given by the Chairman, was responded to by Mr. Irwin, Mr. Wilby, and Councillor Hannam. Mr. Irwin and Mr. Wilby both spoke in high terms of the services rendered by Councillor Hannam and Councillor Connellan in bringing about a settlement of the strike. Other toasts followed.

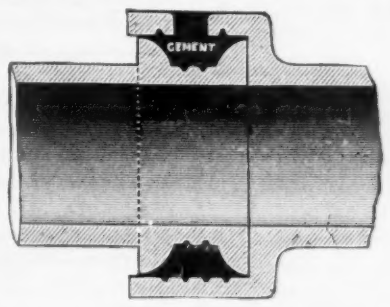
Scaffold Accident at Buxton.—For some weeks St. James's Church, Bath-street, Buxton, has been in the hands of the builder, undergoing restoration. On the 9th inst. a serious accident occurred. At the west end of the church on the south side four or five men were engaged on a platform, and it was their intention to lift a headstone for the window of the porch, the stone weighing some 3 cwt. or 4 cwt., from the platform into position. When about to do so the planks shot from under them, and they all fell, with the headstone and some of the planks, to the ground, about 12 ft. The piece of wood running from the main building, and which supported the planks of the platform, was fastened by a rope to a scaffold pole. This slipped down the pole, and so caused the collapse of the platform. Some of the men were seriously injured.

Re-decoration of the Mansion House, London.—On the 15th inst. the Lord Mayor presided at a meeting of the Court of Common Council held in the Guildhall. Mr. Woodrow, Chairman of the General Purposes Committee, in moving that a sum of 7,550*l.* should be expended in special works of re-decoration at the Mansion House, said that the present condition of the Lord Mayor's residence was not at all creditable. In places the paint had been cleaned until it was black. As to the Egyptian Hall, the floor was three or four inches out of the level, and more like a switchback railway than anything else. Mr. Ellis agreed that some parts of the Mansion House were in a very deplorable condition, but he denied the accuracy of Mr. Woodrow's description of the floor of the Egyptian Hall, and said that a new floor, which would cost 700*l.*, was absolutely unnecessary. The old ball-room was seldom, if ever, used, and he should propose to reduce the expenditure by 1,250*l.* In nine years they had spent 15,629*l.* upon the Mansion House, and the large additional sum which it was now proposed to expend ought to be spread over a number of years. Colonel Thompson seconded the amendment, which was supported by Mr. A. C. Morton, who thought that the proper course would be to sell the Mansion House and build a more appropriate civic residence on a more suitable site. On a division the amendment was negatived by 115 votes against 46, and the report was agreed to. Mr. Wallace, Chairman of the City Lands Committee, presented plans for a new Central Criminal Court to be erected in the Old Bailey on the present site, and after some conversation it was ordered that the report of the committee should be printed, and the committee were empowered to obtain the views of her Majesty's judges as to the plans.

Cabinet Picture Society.—The private view of this Society's inaugural water-colour exhibition will be held at the Society' Gallery, 175, New Bond-street, on Thursday next, the 29th inst., and the exhibition will open to the public on the 30th inst.

An Artist's Triumphal Procession.—The Antwerp correspondent of the *Pall Mall Gazette* gives an interesting account of a popular demonstration in honour of a young artist M. Arthur Sterck, who had obtained the "Prix de Rome" for engraving, at the Antwerp Academy; an account which almost takes one back to the days of the Renaissance and the Cimabue procession. The artist, who resides in Faubourg Berchem, made a triumphal entry into the city in a landau drawn by four magnificent horses, which were decorated with red and white favours, the colours of Antwerp, and preceded by three regimental bands. Behind the carriage, and preceded by the macebearers of the Academy, in full uniform, followed numerous groups of citizens accompanied by the banners of their respective societies. The hero was escorted to the Academy, where speeches of congratulation were delivered. From there he was conducted to the Hôtel de Ville, where the Burgomaster and aldermen, in their robes of office, congratulated him in the name of the city in an eloquent and touching address. Such an honour for the attainment of a scholarship in engraving seems to our ideas rather out of proportion to the occasion, and perhaps there were some personal reasons for the popularity of the artist which do not appear in the report; but at all events it is an interesting instance of popular fervour in the cause of art.

Kirtley's Patent Pipe Joint.—This joint, which is patented by Mr. Kirtley of Sunderland, is one of the best forms of pipe joint for drains recently brought out. The diagram shows the section of the spigot and socket ends of the pipes. The process of forming the joint is in the first place to lay a thin luting of plastic clay or cement on the face of either the spigot or socket end of the pipe, and then press the end home. A thin ring of clay or cement may then be placed round the outside, and thus a perfectly tight cavity or annular space is formed, through which the jointing material cannot escape either to the inside of the pipe or through to the outside. The jointing material may then be poured through one of the holes in the socket till the annular space is filled up. The jointing material may, under ordinary circumstances, be of Portland



cement, or, if from the nature of the ground any subsidence is feared, the patentees recommend that the jointing be done with their elastic bituminous composition. The joint appears to be an excellent one; there is only one point to be guarded against; if cement is used for the first luting, unless it is a very thin film, the pressure of the ends of the pipes together would still tend to thrust out a small quantity of cement at the inside of the joint, which would form a slight internal ridge and might in time give rise to accumulation of matter. The getting rid of all formation of matter at the joints is no doubt one of the greatest difficulties in drain-pipe jointing. In this case the cement forming the actual jointing material cannot produce any such effect; but to a small extent the preliminary luting might.

Belgian Glass.—The Antwerp correspondent of the *Liverpool Journal of Commerce* reports that there is every prospect of an advance in the glass-market there. Prices have already risen there from 5 to 10 cents., and it would not be a surprise if they went still higher. This is owing to the decrease in the output in Belgium. In March last Belgium produced 26,000,000 ft., while in April she only turned out 21,000,000 ft., hence a decrease of 5,000,000.

Master Builders' Association, Johannesburg.—There was a large gathering at the Freemasons' Hall, Johannesburg, on the 18th ult., at the first annual benefit of the Johannesburg Master Builders' Association. Mr. W. Ballantyne (President) was the chairman, and he was supported by Mr. Arburrow (Town Engineer), Mr. Reid (architect and member of the Sanitary Board), Mr. Andrews (Inspector of Buildings), and Mr. Mercer (President of the Trades Council).

Preston Master Builders' Association.—The seventh annual general meeting of this Association was held at the Castle Hotel recently, when, in the absence of Mr. John Walmsley, the President, Mr. T. H. Kellett, presided. The Secretary (Mr. J. Tomlison) read the committee's report for the past half-year, from which it appears that the membership is sixty-nine. Disputes with individual employers had arisen, principally with respect to the apprentice rules, but in most cases had been satisfactorily settled. In the bricksetters' new trade rules, which came into force in May, some concession had been made by the operatives with reference to men employed on country work, but the restrictions were still harassing to Preston employers. The report reviewed at some length the work of the Lancashire Federation, on the committee of which body the local association is represented, and concluded by urging upon members the importance of a strict adherence to the rules. The report was unanimously adopted, and the Treasurer's accounts were approved. Mr. John Christian was elected President for the ensuing year, Messrs. T. H. Kellett and J. Cartmell Vice-Presidents, Mr. R. Croasdale Hon. Treasurer, Messrs. T. Cottam and W. Catterall Hon. Auditors, and a committee of two members from each branch of the trade was also appointed, with an emergency committee of five members to deal with matters of urgency. The question of the undue limitation of apprentices in some branches was considered, and the matter referred to employers interested to lay a proposal before the General Committee. A cordial vote of thanks was passed to Mr. John Walmsley for his services as President during the last six years, and this brought the meeting to a close.—After the meeting about forty members and friends sat down to dinner, the new President (Mr. John Christian) presiding. "The Lancashire Federation of Building Trade Employers" was proposed by Mr. W. Catterall, and Mr. W. Cunliffe, of Bolton, the President of the Federation, acknowledged the toast. He pointed out the advantages of organising the county, and said that the federation was intended to be of use, not show only. He was no opponent of trade unions so long as they kept to their legitimate sphere, but it was very necessary that the contractor's interest should be safeguarded by requiring six months' notice of any demand for an advance, and when, as at Chorley, the operatives left work after giving only fourteen days' notice, he thought they were justified in doing all in their power to resist the men's demands. Mr. Cunliffe dealt with some of the questions requiring the attention of the federation, dwelling more particularly on the restrictions the operatives sought to impose on employers, and the interference the latter had to contend against in carrying on their business. "The Preston Master Builders' Association" was submitted by Mr. Tootell, of Chorley, who referred to the joiners' strike there. Their Association was not a very old one, but he was glad to say that in this matter they had been unanimous in refusing to consider any demand made at such short notice. Mr. F. Marsden responded. Other toasts followed.

CAPITAL AND LABOUR.

Dispute in the Building Trade, Aberdeen.—A dispute has arisen between the Operative Masons and Granite Cutters' Union and a contractor in Aberdeen over the introduction of quarry-wrought material in the building trade. This is stated by the Union to be a contravention of the by-laws agreed on between the employers and operatives.

LEGAL.

CASE UNDER THE LONDON BUILDING ACT:

SCOTT *v.* WALLEN.

At Marlborough-street Police-court, on the 8th inst., Mr. Frederick Wallen, District Surveyor for the Parish of St. Pancras, West, attended before Mr. Plowden to show cause why a notice of objection with respect to certain proposed pilasters at No. 73, Charlotte-street, Tottenham Court-road, should not be quashed.

The building owner, Mr. E. Sanderson, proposed to form a new shop front in the flank wall of his premises, immediately in front of which there had always existed a small area belonging to him, enclosed with railings and about 2 ft. wide, and which railings were to be removed. It was contended on his behalf, by Mr. O. H. Swan, solicitor, that Sub-Sections 3 and 8 of Section 73 entitled him to project the shop front 10 in. beyond the external wall of his premises, and the pilasters on either side a greater distance (in this case 14½ in.).

Mr. Wallen, on the contrary, contended that the restriction as to the 10 in. applied equally to the pilasters as to the actual sashes of the shop front, expressing his opinion that the pilasters in question were part of the shop front and not "like architectural decorations" to those mentioned in Sub-Section 8, inasmuch as none of these would reach the pavement and cause an obstruction.

Mr. P. H. Adams, architect, of Leadenhall-street, put in explanatory plans of the matter in dispute, and also drawings showing how "window or door-dressings" might come down to the pavement.

Mr. Plowden said that the question of "such like architectural decorations" as those mentioned in Sub-Section 8 of Section 73 was one which he did not feel able satisfactorily to decide, the terms used in the Sub-Section being highly technical and unintelligible to him, but as he was called upon to give a decision he should give it in favour of the appellant.

An application for costs was refused.

Mr. Wallen at the outset objected to the form having been taken of serving him with a summons, this being merely an appeal from his notice under Section 150, and suggested that an application to the Magistrate for an appointment, with notice to the District Surveyor, was the proper course.

INTERPRETING THE BUILDING ACT.

Mr. John Genders, trading as Parsons & Co., contractor, of 135, High-street, Wandsworth, appeared before Mr. Denman at the South-West London Police-court, on the 14th inst., to answer an adjourned summons for contravening the Building Act.

Mr. W. W. Young, who prosecuted for the District Board of Works, stated that the defendant had raised a wall at the back of a house in Geraldine-road, Wandsworth, and had subsequently erected a greenhouse on it, with the result that both wall and greenhouse were within 50 ft. of the highway and beyond the general line of building.

Mr. H. R. Jones, for the defendant, urged that the wall was not a building.

Mr. Denman observed that the Act must be so interpreted that each case should be decided more or less on its merits. In this case he did not think

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered.
*Designs, &c. Pavilion, Concert, &c. Rooms	Weston-super-Mare U.D.C.	50l. first, 20l. second, 10l. third	Dec. 10
*Designs for Tower	Liskeard Parish Church Committee	50l. first, and 25l. second	Jan. 1'97
*Designs for Technical School	Sunderland Corp.	100l first, 50l. second, 25l. third	Jan. 16

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by	Tenders to be delivered.
Flint Road Metal	Shoreham (Sussex) U.D.C.	J. E. Brown, Town Hall	Oct. 26
Additions to Asylum, Denbigh	.....	Ellison & Son, Archt 22, St. Thomas-street, Liverpool	do.
Dispensary, Falmouth	.....	J. Freeman & Sons, Penryn, Cornwall	Oct. 27
School Fittings, &c. Pentypridd	.....	A. O. Evans, Archt. Post Office-chambers	do.
Road Works, Bury-road, Newmarket	.....	W. C. & A. S. Manning, Archt. Rothesay House, Newmarket	do.
Additions to Workhouse	Chesterton (Cambs.) Union	J. F. Symonds, 9, Benet-street, Cambridge	do.
Flint Road Metal, &c.	Deal Corporation	T. C. Golder, Boro' Surv.	do.
Guernsey Granite	Southampton Corp.	W. B. G. Bennett, Boro' Engr.	do.
Street Works, Pownall Crescent-road	Colchester Corp.	H. Goodyear, C.E. Boro' Engr.	do.
Drainage, &c. Central-street	Hoyland Nether (Barnsley) U.D.C.	W. Farrington, C.E. Town Hall	do
Shops, Houses, &c. Mountain Ash, Glam.	Duffryn Co-op. Soc.	Morgan & Co. Archt. Mountain Ash, Glam.	do.
*Roadmaking and Paving	Willesden D.C.	O. Claude Robson, Public Offices, Kilburn, N.W.	do.
Street Works	Stockport Corporation	J. Atkinson, C.E. St. Petergate	Oct. 28
Street Works, Rubislaw, &c.	Aberdeen Land Assoc.	Walker & Duncan, Archt. 3, Golden-sq. Aberdeen	do.
Paving Works	Knutsford U.D.C.	W. Downes, surv. Council Offices	do.
Sanitary Works, Brentwood, Essex	Hackney Union	F. R. Coles, Clerk, Offices, Homerton	do.
*Lead Roofing	St. Pancras Vestry	Vestry Hall	do.
Club-house	Allerton (Yorks) Liberal Club Co.	Fairbank & Wall, Archt. Bradford	Oct. 29
Additions, &c. Primitive Methodist Church, Newbury	Trustees	W. H. Bell, Archt Market-place	Oct. 30
Two Villas, Arnside, Kendal	T. Taylor	J. Stalker, Archt. Kendal	Oct. 31
Widening Road, Aberberg	Abertillery U.D.C.	J. A. Sheppard, 1, King-street, Abertillery	do.

CONTRACTS—*Continued.*

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by	Tenders to be delivered.
Villas, Tintagel, Cornwall	.....	Wise & Wise, Archt. Launceston	Nov. 1
Vestry at Calvinistic Church, Wattstown, Rhondda Valley, Glam.	.....	Rev. J. Morgan, Garig-rd. Ynyshir, Glam.	Nov. 2
School, &c. Greetland, Halifax	Elland, &c. Sch. Bd.	Horsfall & Williams, Archt. 15, George-st. Halifax	do.
Sewer, &c. Sunniside, near Crook	Bishop Auckland R.D.C.	C. Johnston, Surv. 1, Craddock-street	do.
Drainage, Muirhead Common, Chryston, N.B.	Cadder Parish Council	Warren & Stuart, C.E. 115, Wellington-st. Glasgow	do.
Kerbing and Paving, Tabley-st. &c.	Northwich U.D.C.	M. Brooke, Town Surv 38, Witton-street	do.
Making-up Headstone-road	Harrow U.D.C.	T. Charles, Council Offices	Nov. 3
*Block of Dwellings	London County Council	Architect's Department, 17, Pall Mall East, S.W.	do.
*Brick Wall	Lewisham B. of W.	B. of W. Office, Surveyor's Department	do.
*Making-up and Widening Roads, Iron Fencings	Tottenham U.D.C.	P. E. Murphy, 712, High-road, Tottenham	do
*Making-up and Paving Road	Fulham Vestry	C. Botterill, Vestry Hall	Nov. 4
Viaduct and Approaches, Relley Mill, Durham	N.E.R. Co.	C. A. Harrison, Central Sta. Newcastle-on-Tyne	do.
*Road Making and Sewers	Harrowdene Building Estate Owners	Walton & Lee, 10, Mount-st. Grosvenor square, W.	do.
*Banking Premises, Post Office, &c.	Directors, Barry Dock, Glam.	Gethin & Wallis, Windsor-chambers, Westgate-st. Cardiff	Nov. 6
*Levelling, Asphalting, &c. Playground	Bexley School Board	Upland Board School	Nov. 9
*School Buildings, Playground, &c.	Little Ilford Sch. Bd.	S. Jackson, 674, Romford-road, Manor-park, E.	Nov. 11
Sewage Works Buildings, Haslingden	Haslingden, Rawtenstall, &c. Sewage Bd.	R. W. Bugler, Clerk, West View, Haslingden	Nov. 14
*New Asylum, near St. Albans	Herts County Asylum Committee	G. F. Hine, Archt. 35, Parliament-st. S.W.	do.
*County Buildings, Llangefni	Anglesey C.C.	Owen, Morris, Roberts, & Son, Portmadoc	Nov. 21
Villas, Kettering	F. Wright	M. Hall, Hounty-grove, Peterborough	No date
Alterations, &c. "Swan Inn," Ulverston	E. & P. Hartley	Settle & Farmer, Archt. Ulverston	do
Re-building Hayes Market, Cardiff	D. Rees & Co. Ltd.	Jones & Co. Archt. 18, St. Mary-st. Cardiff	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.
*Inspector of Nuisances	Tendring R.D.C.	150l. per annum	Oct. 26
*Borough Surveyor	Rawtenstall Corp.	250l. per annum	Oct. 27
*Surveyor	Birkdale U.D.C.	200l. increasing to 250l.	do.
*Clerk of Works	Croydon T.C.	10s. per annum	Oct. 28
*Draughtsman	Hull Corp.	3l. per week	Oct. 30
*Architectural Assistant	Burton-on-Trent Corp.	150l. rising to 180l. per an.	Nov. 4
General Assistant	do.	120l. per annum	do.
*Head Draughtsman	Sunderland Corp.	120l. per annum	No date

Those marked with an asterisk (*) are advertised in this Number. *Competitions, p.* iv. *Contracts, pp.* iv., vi., *&* viii. *Public Appointments, pp.* xviii. *&* xxi.

the mere elevation of the existing wall made it a structure in the meaning of the Act, but undoubtedly the erection of the greenhouse was an infringement. He adjourned the summons to enable the defendant to take down the greenhouse.—*Morning Advertiser.*

PORTSMOUTH BUILDING BY-LAWS.

At the Portsmouth Police-court recently, before Mr. T. Cousins and Commander W. L. Bamber, Charles Hopkins, photographer, of 23, Landport-terrace, Southsea, was summoned under the Public Health Act for erecting a wooden building beyond the main wall of his house without having obtained the consent of the Corporation, and also for having refused to take down the same when requested to do so.

Mr. G. H. King prosecuted, and Mr. Bell (of Southampton) appeared for the defendant.

Mr. King said the building, which was on wheels, was 11 ft. high, and was used for exhibiting photographs. A former summons against the defendant had been dismissed by the magistrates on technical grounds.

Mr. Philip Murch, Borough Engineer, said he had not closely examined the structure in question, but he had seen it. It was built of wood and glass, and stood in the garden in front of defendant's house. It was used by defendant for the exposure of photographs.

Mr. Richard James Jenkins, building and house drainage surveyor, employed by the Corporation, said that he had examined the structure in question. It stood upon wheels, which ran on rails, and could be moved backwards and forwards about 3 ft. 6 in. The erection was first put in the garden on April 2, and was still standing.

Mr. Bell urged that the building was not a building under the meaning of the Section, as it was not a fixture, for it could be taken to pieces, and moved anywhere and erected again. Even in its present position it could be moved from pillar to post. If it was a building the defendant would have to leave it where it stood if he left the house, as it would become part of the freehold, but as it was, the defendant had the right to move it when he liked, and he submitted, therefore, that it was not a building as intended by the Act.

Mr. Cousins, one of the magistrates, said that on the last occasion they had dismissed the case because there was no evidence produced that the Council confirmed the committee's decision, but that had been produced on the present occasion. The real question was, was this studio a building under the meaning of the Act? They were of opinion that it was. The case was on all fours with one quoted by Mr. King, in which Lord Coleridge held that a similar erection to the one in question was a building whether it had wheels or no. They should impose a fine of 13*l.* 14s. 6d., which was 2s. 6d. for every day since the building was erected, and 9s. 6d. costs. If the defendant would agree to take down the building, they might mitigate the penalty.

Mr. Bell said that his client would take down the building in seven days, although he would ask that a case should be stated.

Mr. Cousins objected to a case being stated if the penalty was reduced, and the defendant agreed to abide by the decision of the Court.

Mr. Cousins said they would reduce the penalty to one-fifth of the former fine and forego the costs on condition that the building was removed in seven days.

STEVENS *v.* MEESON.

This case was tried on the 16th inst. in the North London Police-court, before Mr. Bros.

Mr. Henry Stevens had given notice of his intention to erect seven houses abutting upon what had been for more than twenty-one years a back way for carts to the houses in Marsh Hill, Homerton. The way was 8 ft. wide, and it was proposed to widen it to 24 ft. in front of the seven houses. Newly erected houses backed on to the opposite side of the way, and at the Sidney-road entrance of it there had been a wicket gate and a bar to prevent cattle from straying.

The foundations of one house had been commenced, and Mr. Frederick Meeson, the District Surveyor, had served on Mr. Stevens, under Section 150 of the London Building Act, 1894, a notice of objection to his proceeding with the erection of the houses, which notice was now appealed against.

Mr. Macmorran contended that the definition of "street" in Section 5 of the Act included such a road as this, which was, therefore, to be regarded as an old and not a new street, and that it being an old street, the District Surveyor's notice of objection could not be sustained.

The magistrate decided that the road in front of the houses would be a new street, and affirmed the objection of the District Surveyor with 10s. 6d. costs.

ACTION TO RESTRAIN ALLEGED BUILDING TRESPASS.

Mr. Justice Cave, sitting as Vacation Judge, had before him on the 21st inst., the case of Jenkins *v.* Herrald, on a motion to restrain the defendant from committing alleged trespass on premises situated in Queen-street, Hammersmith, and from making any structural or other alterations, or from allowing the alterations to the premises in question already made to remain.

Mr. Ormsby, on behalf of the defendant, asked that the case might be allowed to stand over, in order that he might be enabled to answer four affidavits which had been delivered on behalf of the plaintiff that morning.

After some discussion, his Lordship, upon the defendant giving an undertaking that he would carry the alterations no further until the trial, ordered that the motion should stand till the trial.

Mr. Millar, Q.C., appeared as counsel for the plaintiff.

ALLEGED OBSTRUCTION OF ANCIENT LIGHTS IN CLARE MARKET.

Mr. Justice Cave, sitting as Vacation Judge on Wednesday last, had before him the case of Dye *v.* Patman, on a motion to restrain the defendants from obstructing the plaintiff's ancient lights situated in Clare Market. The dispute arose in connexion with certain alterations which were being made in Clare Market and Clement's Inn-passage, and the plaintiff sought an injunction to restrain the defendant from proceeding with buildings which, he alleged, obstructed the ancient lights in his building.

Mr. Dodds, on behalf of the defendant, said that his contention was that there was no injury whatever to the plaintiff's premises. The defendant was building on property which had been condemned by the Board of Works for the Strand District.

His Lordship said whether it was condemned or not the plaintiff had a right to his ancient lights.

Mr. Dodds replied that he thought not, and, in addition, disputed the allegation that there was any obstruction.

After some further discussion, his Lordship said that the motion would have to stand till the trial. If the plaintiff was found to have suffered damage at the trial he would then not only recover damages, but the defendant might also be ordered to "pull down."

The motion was accordingly ordered to stand till the trial of the action.

A PLYMOUTH BUILDING CASE:

ALLEGED CONTEMPT OF COURT.

Mr. Justice Cave, sitting as Vacation Judge on Wednesday last, had before him the case of Martin *v.* Roberts, on a motion in which the plaintiff asked for a writ of attachment against

the defendant for alleged contempt of Court. The case arose out of certain building operations now proceeding in Plymouth.

Mr. Hopkinson, Q.C., on behalf of the plaintiff, asked that the defendant might be committed for breach of an injunction granted by his Lordship a short time ago, the injunction being to restrain the defendant from proceeding with certain buildings so as to obstruct the ancient lights of the plaintiff, and from otherwise interfering with the plaintiff's rights. The building operations, notwithstanding this injunction, were proceeding, and he had evidence to show that the defendant had expressed his determination to go on notwithstanding the order of his Lordship. He had said, "I do not care about the order of the Court, and I shall go on." In short, he had determined not to take any notice of the order, and to proceed with the building operations.

Mr. Thompson, on behalf of the defendant, denied the use of the words contained in the affidavit read. The defendant never said anything of the kind.

His Lordship: Whether he said it or not, is he doing it?

Mr. Thompson: He says he is not doing it, my Lord. He says he is not obstructing the plaintiff's light and air.

His Lordship said that was what he had been ordered not to do by the term of the injunction granted.

Mr. Thompson: Yes, my lord; he says he is not infringing the order.

His Lordship: Then it is a matter to be decided at the trial of the action.

Mr. Hopkinson said that the evidence placed before the Court on the last occasion was that the defendant was obstructing the plaintiff's light, and now the evidence was that he had gone further with the building, so as to still further obstruct the light. There ought to be some undertaking not to proceed if this motion stood over in order that the question of obstruction should be decided at the hearing. He asked that the defendant should undertake not to continue building, and that he should pull down anything he had commenced since the granting of the injunction until the question at issue was determined at the trial of the action.

His Lordship said that he could not do that. The question was whether the defendant was obstructing the plaintiff's light or not, and that was a question which could only be decided at the trial of the action.

Mr. Hopkinson: But I have an injunction.

His Lordship: Yes, you have got an injunction against his obstructing your ancient lights, but you cannot get an injunction against his building if he is not obstructing your lights. He says he is not, and the question can only be decided when the case comes on for trial, whether he is, or is not, obstructing your ancient lights. All I can do is to let the motion stand over. I do not see how I can give you an order, and the only undertaking the defendant can give is not to obstruct your light, and he says he is not. If it is proved at the trial that he has done so, then you will succeed, and the damages will be assessed accordingly.

The motion was ultimately ordered to stand over to the second motion day next sittings.

MEETINGS.

FRIDAY, OCTOBER 23.

Architectural Association.—Annual Conversazione, to be held at the Church House, Dean's Yard, Westminster. Exhibition of Ecclesiastical drawings, students' work, &c. 8 p.m.

SATURDAY, OCTOBER 24.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at the Southwark and Vauxhall Waterworks, Hampton.

MONDAY, OCTOBER 26.

Carpenters' Hall, London Wall.—Exhibition of Works in Wood and Wood-Carving, open from 11 a.m. to 10 p.m., and for the next three weeks daily.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. H. R. Kenwood on "Infectious Diseases and Methods of Disinfection." 8 p.m.

WEDNESDAY, OCTOBER 28.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at the Metropolitan Cattle Market, York-road, N.

Liverpool Engineering Society.—Inaugural address by the President-elect, Mr. S. B. Cottrell. 8 p.m.

THURSDAY, OCTOBER 29.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. Louis C. Parkes on "Ventilation, Warming, and Lighting." 8 p.m.

SATURDAY, OCTOBER 31.

Institution of Junior Engineers.—Visit to the Hotel Cecil to Inspect its Electric Lighting, Hydraulic, Warming, and other Engineering Features. 3 p.m.

Sanitary Institute.—(Demonstrations for Sanitary Officers).—Inspection at Richmond Main Sewerage Works, Mortlake. 3 p.m.

London and Provincial Builders' Foremen's Association (Memorial Hall, Farringdon-road, E.C.).—Mr. Silvester on "The Manufacture of Portland Cement." 7.30 p.m.

PRICES CURRENT OF MATERIALS.

TIMBER.		
Greenheart, B.G.	ton	£ 8/c/o 0/0/0
Teak, E.I.	load	11/c/o 16/0/0
Sequoia, U.S. ft.cu		2/0 2/1
Ash, Canada load		2/10/0 3/15/0
Birch, do.		3/0/0 4/15/0
Elm, do.		3/5/0 4/10/0
Fir, Dantzic, &c.		2/c/o 4/c/o
Oak, do.		2/15/0 3/15/0
Canada		4/15/0 6/0/0
Pine, Canada red		0/0/0 0/0/0
Do. Yellow		2/0/0 4/c/o
Lath, Dantzic, fath		4/10/0 5/10/0
St. Petersburg		5/0/0 6/10/c
Wainscot, Riga &c., log		2/5/0 4/10/0
Odessa, crown		2/5/0 4/10/0
Deals, Finland 2nd & 1st std 100		7/0/0 8.10/0
Do. 4th & 3rd		7/0/0 8/0/0
Do. Riga		6 10/0 7/10/0
St. Petersburg, 1st yellow		20/0/0 12/10/0
Do. 2nd yellow		8/0/0 10/0/0
Do. white		8/10/0 1c/0/0
Swedish		7/0/0 15/1c/0
White Sea		8/0/0 15/0/0
Canada, Pine 1st		21/1c/o 12/0/0
Do. do. 2nd		14/10/0 15/0/0
Do. do. 3rd, &c.		7/0/0 9/1c/o
Do. Spruce, 1st		7 12/0 9/10/0
Do. do. 3rd and 2nd		7/5/0 8/0/0
New Brunswick		6/0/0 7/0/0
Battens, all kinds		5/0/0 20/0/0
Flooring boards, sq., 1 in. prep. 1st		0/10/0 0/15 0
Do. 2nd		c/5/6 c/10/c
Other qualities—		0/4/6 0/6/0
Cedar, Cuba, ft.		/4½ /5
Honduras, &c.		/4 /5
Mahogany, Cuba		/4½ /6
St. Domingo cargo av.		/4½ 1/3
Mexican, do. do.		/4 5
Tobasco, do. do.		/5 /7
Honduras, do.		/5 /6½
Box, Turkey ton		4/0/0 15/0/0
Rose, Rio		7/0/0 16/0/0
Bahia		6/0/0 15/0/0
Satin, St. Doming		0/0/7 0/1/0

TIMBER *(continued)*.		
Satin, Porto Rico	0/0/7	0/1/6
Walnut, Italian	0/0/3	0/0/7
METALS.		
Iron—Pig, in Scotland ton	2/7/6½	2/7/8½
Bar, Welsh, in London	5/15/0	5/17/6
Do. do. at works in Wales	5/10/0	5/12/6
Do. Staffordshire, in London	5/15/0	6/10/c
COPPER—British cake and ingot	51/0/0	51/10/c
Best selected	51/0/0	51/10/0
Sheets, strong	56/0/0	57/1 /c
Chili bars	47/10/3	0/c/o
YELLOW METAL	c/.4-13/16	0/0/5
LEAD—Pig, Spanish ton	11/1/3	11/2.6
English com. brands	11/2.6	11/7/6
Sheet, English 6 lbs. per sq. ft and upwards	12/7/6	o/e/o
Pipe	12/17.6	o/o/c
ZINC—English sheet ton	19/10/0	o/o/o
Vieille Montagne	20/10/0	o/o/o
Spelter	16/1c/o	16/12/6
TIN—Straits	c7/8/9	c/c/o
Australian	58/17/6	c/c/o
English Ingots	5 1/c/o	62/10/o
Banca	60/10/0	61/0/o
Billiton	59/15/0	60/0/o
OILS.		
Linseed ton	17/0/0	o/o/o
Cocoanut, Cochin	28/0/0	29/0/o
Do. Ceylon	24/10/0	o/o/o
Palm, Lagos	25/0/0	2/0/o
Rapeseed, English pale	28/0/0	o/o/o
Do. brown	26/10/0	o/o/o
Cottonseed ref.	17/0/0	18/0/o
Oleine	19/0/0	20/0/o
Lubricating U.S.	0/6/3	0/7/6
Do. black	0/4/9	0/5/6
TAR—Stockholm barrel	19/6	o/o/o
Archangel	0/12/6	o/o/o
Turpentine ton	21/1c/o	o/o/2

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays.* N.B.—We cannot publish Tenders unless authenticated by the name and address of the sender: and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under £100, unless in some exceptional cases and for special reasons.]

ABERDEEN (N.B.).—For the erection of a school-house, Peterculter. Messrs. Ellis & Wilson, architects, 181A, Union-street, Aberdeen:—

Building.—Fordyce & Morrison, Oldmeldrum.... £860 13
Carpentry.—Leslie & Hay, Aberdeen
Plastering.—David Scott, Aberdeen
Plumbing.—Jas. Matthews & Son, Aberdeen
Painting.—Edward Copeland, Aberdeen
Slating.—Andrew Davidson, Banchory

BATTLE (Sussex).—Accepted for the supply of 120 tons c.i. pipes, &c., for the Rural District Council. Mr. P. H. Palmer, C.E., Town Hall, Hastings:—

	3-in. pipes.	4-in. pipes.	Irregulars.
	£ s. d.	£ s. d.	£ s. d.
Stanton Ironworks Co., London	5 6 6	4 17 6	8 10 0

BELFAST.—For the erection of two dwelling-houses, University avenue. Mr. J. G. Lindsay, architect, 6, Chichester-street, Belfast:—

Hugh Vance	£764 14	T. & H. Jameson	£586 0
Robert George	683 0	John McKnight, Killyleagh (accepted)	560 0
Jas. Macartney	647 0		

BEXLEY HEATH.—Accepted for the supply of road materials, granite, &c., for the Urban District Council. Mr. E. Reeve Sculter, Surveyor, Bexley Heath:—

Quenast Granite.—C. M. Mannelle, Lime-street, London, E.C.
Stoney Stanton Granite.—Mountsorrell Co., Loughborough
Surface-Picked Flints.—Thomas Wood, Crockenhill, Swanley
Kentish Ragstone (broken)—Benstead & Son, Maidstone
Kentish Ragstone, Spalls, &c.—Joseph S. Gabriel, Maidstone
Granite Curb—Gordon & Sons, Annalong, Newry
Granite Setts.—Gordon & Sons, Annalong, Newry
Hire of Steam Roller.—Thomas Wood, Crockenhill, Swanley
Stoneware Pipes.—Wragg & Sons, Swadlincote
} At Schedule of Prices.

BIRMINGHAM.—For works, Jameson-road, Nechells, Birmingham, for the Fairbanks Rim Manufacturing Company, Limited. Mr. H. Hendriks, F.S.I. London:—

Geo. Law	£4,311	T. Johnson	£3,800
Merton Hughes	3,691	H. Wilcox	3,500
J. E. Moorhouse	3,982	H. Weldon, Birmingham*	3,300
		* Accepted.	

BOSTON (Lincs).—For the erection of school buildings and teacher's residence, Eastville, for the School Board. Messrs. Mortimer & Son, architects, Unity-square, Lincoln:—

Hubbard & Pogson	£940 0	H. W. Parker	£819 10
Jas. Richardson	930 0	Hunter & Son, Spilsby*	810 0
Bradley & Cade	855 0	* Accepted.	

BOURNEMOUTH.—For making up Bennett and Fitzharris-roads, Bournemouth. Mr. F. W. Lacey, Borough Engineer and Surveyor:—

George Troke	£255 3 2	W. H. Saunders & Co.*	£244 3 0
		* Accepted.	

BOURNEMOUTH.—For making up Beckford and Windsor-roads and road to Artillery Headquarters. Mr. F. W. Lacey, Borough Engineer and Surveyor:—

George Troke	£248 11 3	W. H. Saunders & Co.*	£233 11 0
		* Accepted.	

BRIGHTON.—For additions, &c., to town hall, for the Corporation. Mr. F. J. C. May, C.E., Borough Surveyor, Town Hall, Brighton:—

P. Peters & Son	£33,500	W. A. Field & Co., Brighton*	£30,891
J. Martin	32,300		
J. Longley & Co.	31,939	* Accepted.	

BROMLEY (Kent).—For the erection of houses, Glebe-road. Messrs. F. & W. Stocker, architects, 90 and 91, Queen-street, E.C.:—

F. W. Green	£2,950 0 0	A. W. Knight	£2,205 0 0
W. Smith & Son	2,800 0 0	H. Buck & Co.	2,090 0 0
H. C. Wills	2,750 0 0	Johnson & Aldridge	2,070 0 0
Joseph Ashford	2,450 0 0	C. R. Gurr	2,050 0 0
G. Wilkinson & Sons	2,450 0 0	F. W. A. Philpot	1,996 7 4
Thomas & Edge	2,409 0 0	A. G. McDowall, 27, Calais-street, Camberwell (accepted)	1,675 14 0
J. Watt	2,250 0 0		
E. J. Taylor	2,245 0 6		
W. Furniss	2,240 0 0	J. Grier & Co.	1,470 0 0

CARDIFF.—For the erection of ninety-five houses, Court Estate Cadoxton, for the Weston Building Club. Mr. F. Gibson, architect, Pontypridd:—

C. Jenkins & Son	£18,335	A. Seaton	£15,580
W. Lissaman & Son	15,960	Jno. Griffiths, Trealaw*	15,485
		* Accepted.	

CROYDON.—For the erection of "The Arcade," High-street. Mr. A. Broad, architect, 3, High-street, Croydon. Quantities by the architect:—

W. H. Lorden & Son	£5,311	W. H. Lascelles & Co.	£5,100
W. Smith & Son	5,280	S. Hart	5,090
E. P. Bulled & Co.	5,241	A. Bullock	4,975
Maides & Harper	5,225	J. Smith & Sons	4,842
D. W. Barker	5,174	W. Manuage & Co.	4,819
S. Page	5,150	E. J. Saunders (accepted)	4,810

DOVER.—Accepted for the erection of stables, engine-house, &c., Tower Hamlets-road, for the Town Council. Mr. H. E. Stilgoe, Borough Engineer:—

G. Munro £3,480

FLAMSTEAD (Herts.).—For the erection of school buildings, for the Urban District School Board. Mr. A. E. Smith, architect, Church-street, Luton, Beds:—

T. & E. Neville	£430
S. C. Smith, Hemel Hempstead (accepted)	415

GREASBOROUGH (Yorks.).—Accepted for the supply of 6,310 yards c.i. water-pipes, for the Urban District Council:—

Newton, Chambers, & Co., Thorncliffe, Sheffield ... £4 10 Per ton, delivered at Rotherham.

HASTINGS.—For the erection of a fire-engine house, Silverhill Waterworks, Silverhill, for the St. Matthew's Parish Council. Messrs. Jeffery & Skiller, architects, 5, Havelock-road, Hastings. Quantities by architects:—

Russell & Son	£268 0 0	J. Elliott	£239 0 0
J. Lester	270 0 0	E. Gutsell, Silverhill*	225 9 0
E. Hunter	268 19 6	J. Geary	205 0 0
Padgham & Hutchinson	246 0 0	*Accepted.	

LEEDS.—For the erection of ten through houses, Linden-road, for the Industrial Co-operative Society, Limited. Mr. W. H. Rawnsley, architect, 21, Crawford-street, Leeds:—

Plasterer's Work.
J. D. Dakin, Towers View, Woodhouse £166 0
Slater's Work.
Sharp & Harper, Water-lane, Leeds 85 10
[Brick and mason work, &c., not yet let.]

LEYTON.—Accepted for additions, &c., to old Town Hall, for the Urban District Council. Mr. W. Dawson, C.E., Town Hall, Leyton:—

F. J. Coxhead, Leytonstone £447 16

LOCKS BOTTOM.—For alterations and repairs at the "White Lion" inn, Locks Bottom, Kent, for Nalder & Collyer's Brewery Company, Limited. Mr. Robert M. Chart, architect, Croydon:—

J. Quittenton	£358	Smith & Sons, Bromley Common*	£294
A. Bullock	321		
E. Goulder	307	* Accepted.	

LONDON.—Accepted for additions and alterations to residence, No. 99, Truro-road, Wood Green, for Mr. M. Graefe. Mr. D. Taylor, architect and surveyor, Bowes Park:—

W. Barrett, 65, Myddleton-road, Bowes Park, £250.

LONDON.—For the erection of a superintendent's house, Hammersmith, for the managers of the Kensington and Chelsea School District. Mr. Cecil A. Sharp, architect, 59, Fenchurch-street, E.C.:—

G. Wilkinson & Son	£1,590	B. Pope & Co., 119, Glenthorne-road, Hammersmith*	£695
Scharieu & Co.	1,463		
W. Nash & Co.	1,340	* Accepted.	
T. W. Thomas	1,075		

Architect's estimate, £875.

LONDON.—For alterations and repairs at the "Victory" public-house, Trafalgar-road, S.E., for Mr. W. J. Huxley. Messrs. Lawson Brothers, architects and surveyors, Great Dover-street:—

Grover	£364 0	Wilson	£294 10
Eames (accepted)	300 0	Simpson & Cove	293 0

LONDON.—For the rebuilding of the Hotel de Paris, Leicester-square, W.C., for Mr. Richard Baker. Messrs. Saville & Martin, architects, Dacre House, Arundel-street, Strand, W.C. Quantities supplied by Messrs. Woodward & Argent, 7, Duke-street, Adelphi, W.C.:—

Foster & Dicksee	£44,912	Colls & Co.	£42,790
Higgs & Hill	44,790	Kirk & Randall	42,238
Mowlem & Co.	43,119	Bywaters & Co.	41,750
Holland & Hannan	42,990	Patman & Fotheringham	39,172

LONDON.—For the erection of the South-Western Ambulance Station, Landor-road, Stockwell, for the Managers of the Metropolitan Asylums Board. Mr. Thos. W. Aldwinckle, architect. Quantities by Mr. W. T. Farthing:—

H. Faulkner & Co.	£15,499	Kirk & Randall	£13,375
General Builders, Limited	14,639	F. G. Minter	13,300
G. Godson & Sons	13,495	H. Wall & Co.	13,040
J. Shillitoe & Sons	13,490	W. Johnson & Co., Ltd*	12,830
		* Accepted.	

LOWESTOFT.—For the erection of technical and art schools, for the Technical Instruction Committee of the Corporation. Mr. George Wm. Leighton, architect, 6, Princes-street, Ipswich:—

Shillitoe & Sons	£6,500 0	J. & B. Swatman	£5 314 9
J. Ashby	5,755 0	G. E. Hawes	5 198 0
R. Girling	5,525 0	A. Bedwell, Lowestoft*	4,995 0
S. Parmenter	5,499 0	* Accepted.	

MARK (Somerset).—For the reconstruction of Stuckey's Bridge, for the Somersetshire Drainage Commissioners. Mr. William Lunn, engineer:—

W. Brettell	£288 10 6	H. W. Pollard	£222 0 0
G. Palmer	250 6 0		

NEW ROSS (Ireland).—For the construction of a reservoir, &c., Ballyhack, for the New Ross Union Guardians. Mr. Webster County Surveyor, Wexford:—

P. Harney	£250 0
A. J. Stephens, Duncannon, co. Waterford (accptd.	19 5

ROTHWELL.—For the supply of granite, for the Rothwell Urban District Council, Mr. W. T. Pearson, Surveyor:—

	Granite X.		Granite XXX.		Chippings.	Screenings.	XXX.
	Desboro'.	Rushton.	Desboro'.	Rushton			
	Per ton. s. d.	Per ton. s. d.	Per ton. s. d.	Per ton. s. d.	Per ton. s. d	Per ton. s. d.	Per ton. s. d.
Mountsorrel Granite Company—							
Mountsorrel Granite	9 3	10 0	8 6	9 3	6 9 & 7 6	..	..
Stoney Stanton Granite	..	..	7 0	8 0	..	..	..
Ellis & Everard, Kettering	..	..	8 9	8 9	..	5 6	7 9
Fergusson & Starkey, Leicester	..	..	8 0	7 11	5 5 & 5 6	..	8 3 & 8 2
Enderby and Stoney Stanton Granite Company, Narborough, near Leicester	..	..	7 11	8 0	5 5 & 5 6	..	8 2 & 8 3
Whitwick Granite Company, Coalville, near Leicester	7 7	7 11	7 7	7 11	5 9 & 5 5	..	7 6 & 7 2
Groby Granite Company, Groby, near Leicester	..	..	7 9	7 10	4 6 & 4 7	5 6 & 5 7	..
Croft Granite Company, Croft, near Leicester	..	..	7 9	7 10	4 5 & 4 6	..	8 0 & 8 1
Forest Rock Company, Whitwick, near Leicester	..	..	7 8	7 9	5 6 & 5 7	..	7 8 & 7 9
Midland Quarry Company, Nuneaton	..	..	7 8	7 8	5 2	..	6 3
Narborough & Enderby Granite Quarries Company, Narborough, near Leicester*	..	..	7 7	7 8	5 3	..	..

* Accepted.

[Croft Granite Company's tender accepted for chippings. Narborough & Enderby Company's tender accepted for broken granite. Kettering Iron & Coal Company's tender accepted for slag, 4s. 6d. and 4s. 4d.]

PATELEY BRIDGE (Yorks).—For the execution of sewerage works, &c. (Contract No. 1), for the Rural District Council. Mr. H. A. Johnson, C.E., 14, The Exchange, Bradford:—

A. Braithwaite & Co.	£3,998
Ironwork.	
J. Blakeborough & Sons	487

SKEGNESS.—For the erection of a residence, South Parade, for Miss A. K. Kirby. Messrs. Sheppard & Harrison, architects, 17, Kirkgate, Newark-on-Trent. Quantities by the architects:—

F. W. Crossland	£2,778 8 0	Geo. Brown & Son	£2,614 0 0
Geo. Henderson	2,768 0 0	R. Hockley & Son	2,608 0 0
S. G. Mackenzie & Sons	2,614 15 6	J. Crawshaw	2,486 0 0
		S. Sherwin	2,327 0 0

STOURBRIDGE. — For the execution of sewerage works (Contract No. 12), for the Upper Stour Valley Main Sewerage Board. Messrs. Marten & Fiddian, engineers, Church-street Chambers, Stourbridge:—

Currall & Lewis	£13,546 13 9	John Mackay	£10,941 7 2
George Law	12,916 0 0	Thomas Vale, Stourport (accepted)	10,421 17 6
Jones & Fitzmaurice	12,295 2 11		

TWO WATERS.—For a new bridge at Two Waters, Hemel Hempstead, for the County of Hertford. Mr. Urban Smith, C.E., County Surveyor:—

J. Payne	£669 7 9	C. Hunt, High Wycombe*	£547 7 6
S. C. Smith	605 15 5		
J. Dickson	584 7 0		

* Accepted.

WATFORD.—For a new police-station at New Town, Watford, for the County of Hertford. Mr. Urban A. Smith, C.E., County Surveyor:—

Smith & Sons	£4,177	T. Turner, Limited	£3,497
G. Wiggs	3,793	G. H. Gibson	3,390
J. Payne	3,659	W. Judge, Watford*	3,200
C. Hunt	3,616		

* Accepted.

WELSHPOOL.—For the erection of school buildings, for the Governors of the County Intermediate Schools. Mr. F. H. Shayler, architect, 26, Severn-street, Welshpool. Quantities by architect:—

E. Davies & Son	£3,783 0	Bradney & Lloyd, Shifnal*	£3,060 0
W. H. Thomas	3,395 0	Evan Davies†	2,783 0
Treasure & Son	3,205 0		
Evans & Felton	3,196 2		

* Recommended for acceptance. † Withdrawn.

WICK (N.B.).—For the improvement of the Harbour, for the Wick and Pulteney Harbour Trustees. Mr. James Barron, C.E., Aberdeen:—

Pedrette & Co.	£30,371 12 6	William Oliver	£15,585 10 6
James Watson	28,242 12 9	Thomas Munro	14,251 7 10
George Lawson	20,809 10 8	W. Tilburn, Crosshill, Glasgow*	14,188 6 9
John Adam & Co.	18,631 17 0		
George Rhind	16,479 16 3		

* Accepted.

LONDON SCHOOL BOARD TENDERS.

The following lists of tenders have just been submitted to the London School Board by the Works Committee of that body:—

BAILEY'S-LANE SITE.—Removing two temporary iron buildings from the Bailey's-lane Site, and re-erecting one on the Trafalgar-square Site, and the other on the Ennersdale-road Site, and fitting up the iron building remaining on the Bailey's-lane Site &c.:—

T. Cruwys	£1,260 0 0	D. Charteris	£830 0 0
Croggon & Co., Lim.	910 0 0	W. Harbrow*	813 0 0
Humphreys, Lim.	854 16 5		

* Accepted.

BELVEDERE-PLACE.—Providing roof and skylights:—

H. Line	£159	I. Marsland	£128
Johnson & Co.	140	G. Brittain*	109

* Recommended for acceptance.

BURRAGE-GROVE.—Re-building offices for all departments, and providing new drainage:—

Mid-Kent Building and Contracting Works, Ltd.	£2,154	W. Akers & Co	£1,849
J. F. Ford	1,997	I. Otway	1,812
Gregar & Son	1,960	E. Triggs	1,798
G. Parker	1,850	J. & C. Bowyer	1,785
		J. Marsland*	1,775

* Recommended for acceptance.

CANAL-ROAD.—Providing additional heating:—

J. & F. May	£149 0	Vaughan & Brown, Ltd.	£123 10
J. Defries & Sons, Ltd.	135 0	W. G. Cannon & Sons	90 10
Wontner-Smith, Gray & Co.	117 10	Duffield & Co*	90 0

* Recommended for acceptance.

CENTRAL-STREET.—Improvements:—

Dove Bros.	£1,275	Thompson & Beveridge	£1,338
E. Lawrance & Sons	1,183	G. S. S. Williams & Son	1,096
Gregar & Son	1,059	Staines & Son	956
McCormick & Sons	1,047	W. Irwin*	911
Willmott & Sons	1,042		

* Recommended for acceptance.

"CHAUCER."—Enlargement of school, &c.:—

Perkins & Co.	£17,316 0 0	Holliday & Greenwood	£15,863 0 0
E. Lawrance & Sons	16,629 0 0	Lathey Bros.	15,680 0 0
W. Downs	16,350 0 0	G. Munday & Sons	15,573 13 8
T. F. Collinson	15,992 0 0	J. Smith & Sons	15,446 0 0
J. Marsland	15,885 0 0	Treasure & Son*	15,067 0 0

*Recommended for acceptance.

"FOX."—Erecting manual training centre, &c.:—

Thompson & Beveridge	£1,654 0	J. F. Ford	£1,153 12
J. & M. Patrick	1,305 0	E. Triggs	1,152 0
E. T. Folley	1,279 0	H. Somerford & Son	1,133 0
G. Neal	1,277 0	Lathey Bros*	1,129 0
R. A. Yerbury & Sons	1,237 0	Garrett & Son	885 0
W. Hammond	1,197 0		

* Recommended for acceptance.

HIGH-STREET (Plumstead).—Covering hot-water pipes with non-conducting composition:—

Leroy & Co.	£50 0 0	Pidduck & Co.	£36 15 0
London Asbestos Co.	48 0 0	Goodman & Co.	35 0 0
Eagle Non-conducting Cement Co.	41 0 0	Bell's Asbestos Co., 1s. per ft. super.	
M. Keenan	39 11 4	Toope's Asbestos Co.*	31 14 0

* Accepted.

PRIORY GROVE SITE.—Removing a temporary iron building from the Fircroft-road site, and re-erecting it on this site:—

T. Cruwys	£320 0	E. Lawrance & Sons	£336 0
Croggon & Co., Limited	372 10	D. Charteris	320 0
Humphreys, Limited	343 10	W. Harbrow*	310 0

* Accepted.

ST. ANDREW'S-STREET.—Erecting laundry centre:—

Maxwell Bros., Lim.	£926 0	E. Triggs	£706 0
Holloway Bros.	825 0	H. Somerford & Son	692 0
W. Hammond	766 10	Lathey Bros.	679 0
W. V. Goad	737 0	H. Leney	674 0
W. Downs	710 0	Garrett & Son*	633 0

* Recommended for acceptance.

Fitting up Board's Stores at Clerkenwell.

Lascelles & Co.	£3,000	Illingworth, Ingham, & Co. (accepted)	£3,203

ST. GEORGE'S-ROW.—Erection of a new school, with schoolkeeper's-house, &c.:—

W. Downs	£18,382	J. & M. Patrick	£17,230
Lathey Bros.	17,987	Longley & Co.	17,236
J. Shillitoe & Son	17,558	E. Lawrance & Sons	16,811
Holloway Bros.	17,476	W. Shurmur	16,781
D. Charteris	17,438	Foster & Dickson	16,666
Killby & Gayford	17,436	Stimpson & Co.	16,340
Grover & Son	17,268	Treasure & Son*	15,571
J. Marsland	17,265		

* Recommended for acceptance.

UPPER KENNINGTON-LANE.—Erecting laundry centre:—

Marshall Bros., Limited	£874 0	E. Triggs	£700 0
W. Downs	796 0	H. Somerford & Son	674 0
W. & H. Castle	774 8	J. Marsland	630 0
J. Smith & Sons	764 0	Garrett & Son	591 0
W. V. Goad	720 0	J. F. Ford*	586 10

* Recommended for acceptance.

WILLIAM-STREET.—Providing additional heating, &c.:—

J. Defries & Sons, Ltd.	£197 10 0	G. Davis	£131 0 0
W. G. Cannon & Sons	179 0 0	J. W. Brooke	116 0 0
J. C. & J. E. Ellis, Ltd.	157 10 0	J. Biggs	108 16 8
		Bates & Pearce	107 14 0
		Duffield & Co.*	103 0 0

* Recommended for acceptance.

TO CORRESPONDENTS.

W. C. E., W. T., J. R., G. H. (Below our limit).—T. N. (We cannot publish lists of tenders unless amounts are stated).

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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